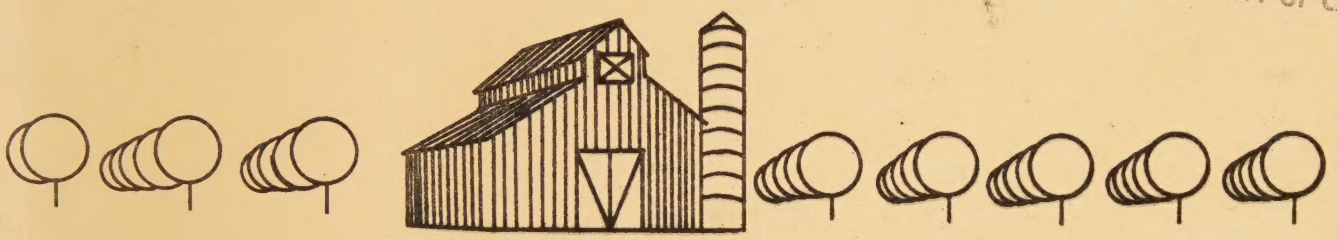
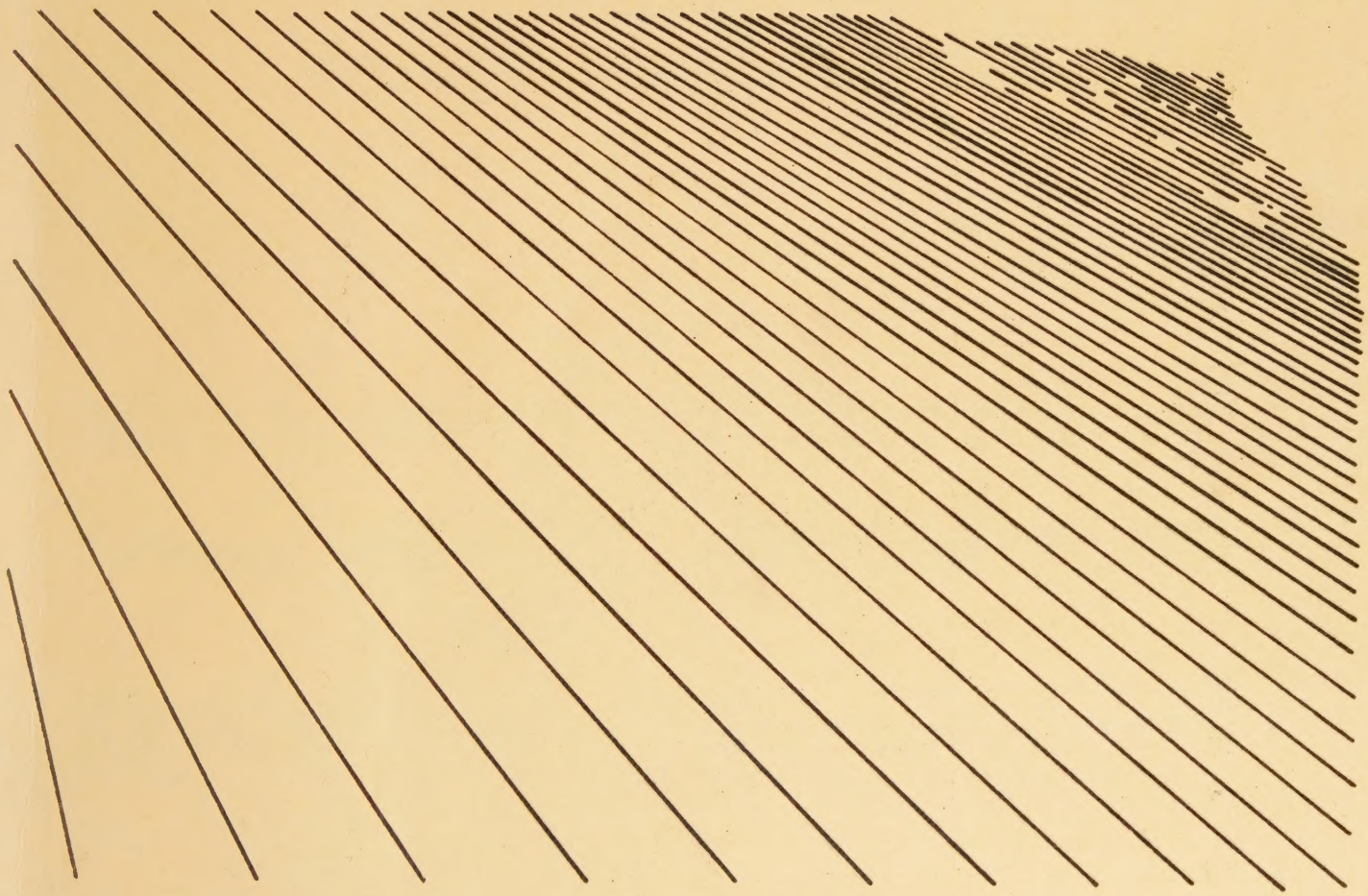
AGRICULTURAL ELEMENT

OF THE

MERCED COUNTY GENERAL PLAN





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MERCED COUNTY GENERAL PLAN

Merced County
Planning Department

December, 1984

Approved by the Planning Commission
by Resolution No. 3959

Mary Wickstrom 8/8/84
Mary Wickstrom, Chairman Date

Robert A. Peterson
Robert A. Peterson
Secretary

Adopted by the Board of Supervisors
by Resolution No. 84-284A

Al Goman 12/17/84
Al Goman, Chairman Date

Kenneth L. Randol
Kenneth L. Randol
Ex-Officio Clerk of the Board

AGRICULTURAL ELEMENT
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MERCED COUNTY GENERAL PLAN

ACKNOWLEDGEMENTS

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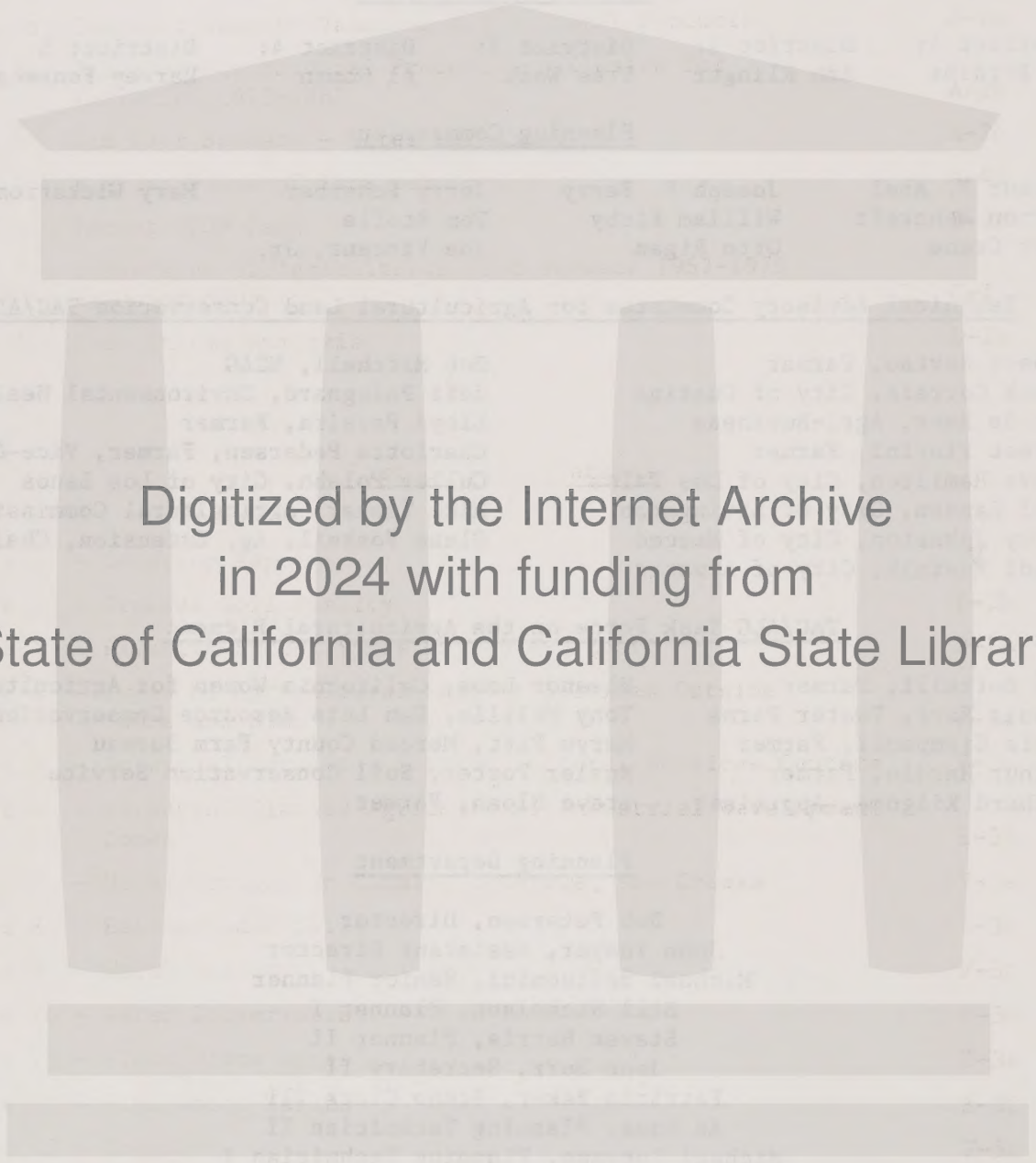


TABLE OF CONTENTS

List of Tables

List of Illustrations

MERCED COUNTY AGRICULTURAL ELEMENT

SUMMARY

The Agricultural Element of the Merced County General Plan is an effort by the County to analyze the present status of agriculture and to enact policies that will improve the viability of agricultural operations and promote the conservation of agricultural land. Presented below is a summary of each background section followed by a listing of the main goals of the Element and the policies the County has adopted to achieve them.

A. Economics of Agriculture

The county economy is heavily dependent upon the agricultural sector. Rising costs of land, water, energy, labor, and interest on farm debt - coupled with depressed sales prices and poor weather - has led to reduced crop production values in recent years. Farm sales, when adjusted for inflation, decreased by $73 million between 1980 and 1982. The County should encourage all efforts to improve the financial viability of agriculture through promotion of agricultural industries through financial incentives such as industrial revenue bonds and possible enactment of tax relief measures for farmland.

B. Soils Analysis

The county is blessed with a large amount of prime and highly productive soil. Unfortunately, most of the urban centers (Specific Urban Development Plan areas, SUDPs) are located on the best quality soils. Sufficient land has been provided for urban growth within the SUDP boundaries - enough to accommodate about 347,550 additional residents, 3.7 times the 1980 population - that any expansion of urban use onto productive soils outside the SUDPs represents a premature conversion of agricultural land.

C. Conversion of Agricultural Land

A total of approximately 3,650 acres of farmland was converted to urban use between 1967-1979. Additional losses to agricultural production resulted from creation of rural "ranchette" developments which are used for 5-20 acre homesites, and to a limited extent, from mineral excavation. Conflicts between agricultural and urban uses result in complaints over dust, noise, odor, pesticide use, and insects which often results in restrictions on farming operations and reduced productivity.

D. Parcel Size Analysis

The "Existing Parcel Sizes in the A-1 Zone" map shows that large portions of the county within the 20 acre minimum parcel size zoning classification presently consists of much larger parcel sizes. Given the same physical characteristics, areas with parcels 40 acres or larger are more likely to remain in active agricultural use than areas with parcels 20 acres or less. And an analysis of crop production costs in the county reveals that in most instances, the minimal profit potential on farms of 20 acres reflects the increased probability that they are part-time operations. The existence of 72,700 acres presently in 20-39 acre farms suggests that enough opportunity exists for new and part-time farmers to purchase land within the county even if the minimum parcel size was increased in many other areas.

E. Agricultural Support Services

At the present time, most agricultural processing and support operations are located within SUDPs or are scattered throughout the county's agricultural landscape. These uses often have environmental or growth inducing impacts. By redesignating some smaller non-sewered SUDPs as Agricultural Services Centers, which would allow limited agricultural support and convenience commercial operations and housing at one dwelling unit per acre, potential urban/agricultural impacts can be minimized. And the location of new agricultural industries in concentrated Planned Agricultural Industrial Development zones would help control environmental impacts and reduce the loss of productive agricultural land.

F. Irrigation, Flooding, and Drainage

Many areas of the county are experiencing agricultural water quality and supply problems. Most of these problems are found in the valley trough, especially west of the San Joaquin River, and to the south of Merced City. These are also the primary areas affected by flooding problems and high water tables. Where drainage and leaching practices are used, intensive crop production is possible in some of these areas. Drainage practices are presently implemented on a local level with the assistance of Resource Conservation Districts and local irrigation and water districts. But a more comprehensive effort will be required to maintain ground and surface water quality and to reduce heavy flood damage to agriculture in wet winters. The recent discovery of selenium and other trace element contaminants at the Kesterson Reservoir highlights the need for a permanent drainage solution in Merced County and the larger San Joaquin Basin.

G. Summary of Goals and Policies

Goal 1: Seek to improve the financial viability of the agricultural sector.

The Element proposes programs to provide financial incentives, such as industrial revenue bonds, to attract new agricultural industries to the county. A study on the economic feasibility of adopting the Williamson Act and the provision of conservation easements as measures to reduce the tax burden on farmland and aid in the preservation of agricultural land will be made.

Goal 2: Provide for the long-term conservation and use of productive agricultural lands.

The conservation of agricultural land will be achieved through permitting conversion only where a clear and immediate need for development can be demonstrated and by encouraging infill development. Another possible means to conserve farmland by increasing the minimum parcel size in agricultural zones will be studied by TAC/ALC. Where conversion is justified, development will be directed to less valuable farmland. To reduce conflicts between urban and agricultural areas, a proposed "Right to Farm" ordinance may be adopted requiring public notification of potential inconvenience and discomfort from residing next to agricultural zones.

Goal 3: Assure the proper location and operation of those land uses which are potentially disruptive to the agricultural community.

Creation of centers restricted to agricultural support and convenience commercial operations called Agricultural Services Centers as well as encouragement of locating new agricultural industries in SUDPs and PAID zones, will help reduce environmental and growth related impacts. The use of land use transitions and buffers between urban and agricultural land is proposed to reduce conflicts. Mineral excavation on agricultural land will be controlled by conditional use permits. More efficient agricultural products transport is proposed by an additional north-south road crossing the county, or improvement of existing State Highways.

Goal 4: Improve the management of water resources to benefit the agricultural community.

The Board of Supervisors will cooperate with efforts of local, regional, and state agencies and groups to provide adequate surface water supplies to deficient areas and to reduce water contamination through the monitoring of groundwater quality and support of agricultural drainage efforts. Implementation of programs to protect rural development and farmland from flooding will continue.

II. INTRODUCTION - PURPOSE

The Agricultural Element is an effort by the County of Merced to revise the General Plan to reflect the importance of agriculture in the county. It was undertaken to analyze the present status of agriculture and to propose solutions to the problems that exist. The purpose of this Element is to define policies that will improve the viability of agricultural operations and promote the conservation of agricultural land.

The Element consists of a presentation of background information in Sections A-F, and the outlining of goals, objectives, and policies to achieve the purpose of the Element in Section G. Implementation measures are presented after each policy. One term used throughout this Element requires a definition: productive agricultural land or soils. This includes all good quality soils - Prime, Statewide Important, and Unique on the Important Farmland Map, and Capability Class I - IV on the Soil Survey of the USDA Soil Conservation Service - as well as poor soils that are presently or potentially producing agricultural commodities.

This Element was completed by the Planning Department with the assistance of the Technical Advisory Committee for Aricultural Land Conservation, (TAC/ALC). The membership of TAC/ALC consists of representatives of various public agencies, the six cities in the county, and five farmers appointed by the Board of Supervisors. The Task Force on the Agricultural Element included additional farmers and representatives of various farm organizations. The cooperation of the TAC/ALC members and their unselfish volunteer commitment in dratting this document cannot be sufficiently acknowledged.

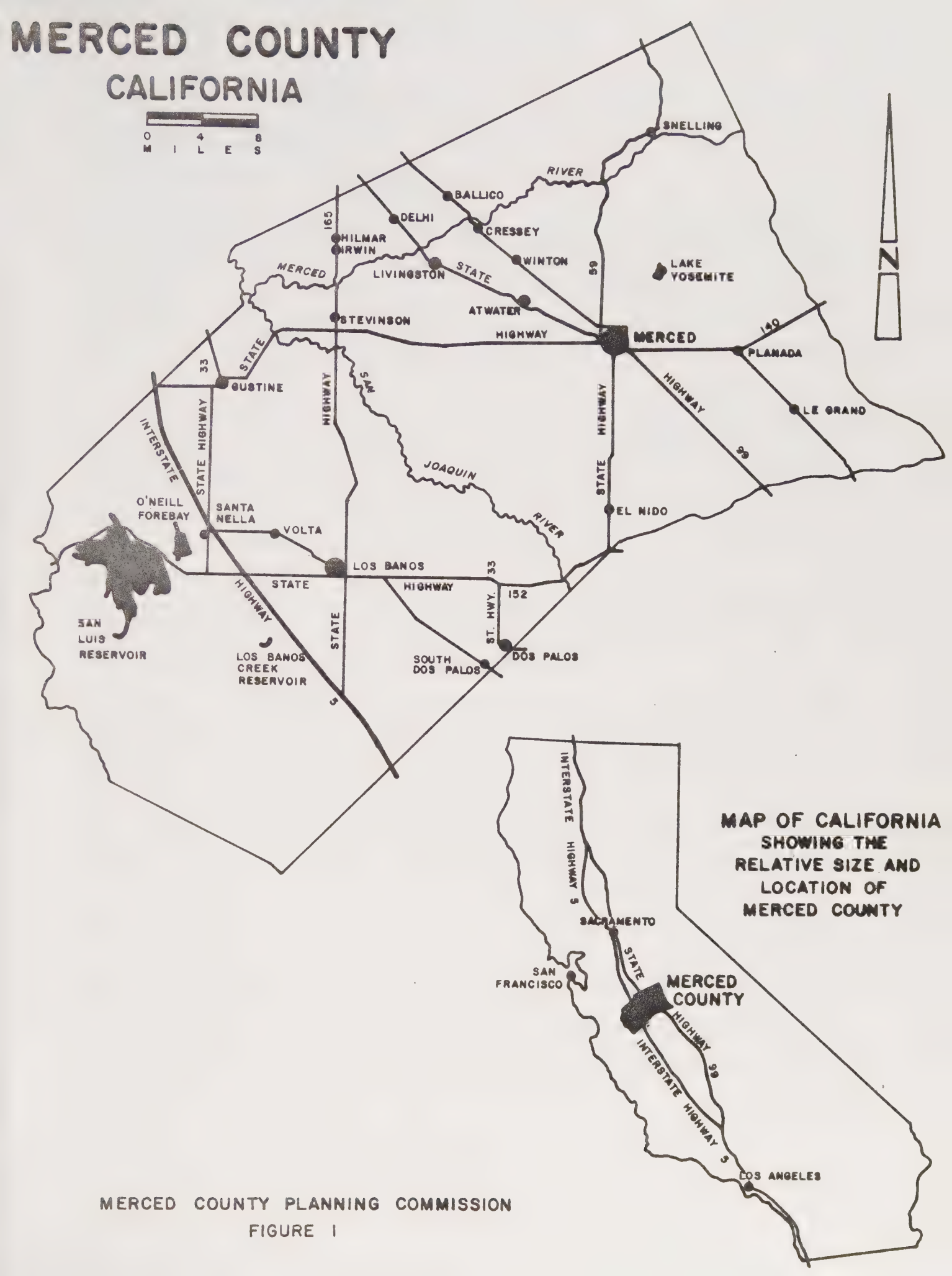
GEOGRAPHY - HISTORY

Merced County is located near the center of California in the San Joaquin Valley. It is bounded by the Sierra Nevada Mountains in the east and the Coastal Range to the west. The soil consists of a large fertile alluvial fan in the east side of the county resulting from centuries of erosion in the Sierras. In the west side, a limited alluvial fan from the Coastal Range was formed resulting in more shallow soil depth.

The first settlements in the county were the very large Spanish land grants in the west side as early as 1834. During the gold rush, this area became a major feeding stop for sheep and cattle being herded over the Pacheco Pass to San Francisco.

The raising of wheat was introduced in the 1850's relying on natural rainfall for irrigation. By 1880, 1,500 to 2,000 acres near the Merced River were irrigated through man-made channels. And in 1888, with completion of Lake Yosemite, irrigation water was finally available to lands far from the Merced River.

The current agricultural landscape in the county reflects these early development forces: large cattle ranches and farms are found in the west, while smaller farms are located in the east because of the water supply, superior soil quality, and early introduction of the railroads as a transportation link. Today, Merced County ranks in the top ten agricultural counties in the State for overall production and in the top five for some crops.



MAP OF CALIFORNIA
SHOWING THE
RELATIVE SIZE AND
LOCATION OF
MERCED COUNTY

MERCED COUNTY PLANNING COMMISSION

FIGURE 1

III. THE AGRICULTURAL ELEMENT

A. ECONOMICS OF AGRICULTURE

ROLE OF AGRICULTURE IN LOCAL ECONOMY

CROP VALUES/CONTRIBUTION: The contribution agricultural production makes to the economy of Merced County cannot be overemphasized. More than 90 different crops are grown commercially in the county, making it one of the most diverse agricultural areas in the nation and the world. Agricultural crops and products gross value in 1982 was $743,030,000, a 3% drop from the 1981 value. Crop losses due to weather problems throughout the year, combined with depressed prices of most commodities, led to a consecutive second year decline in the value of crops produced in Merced County.

Milk production is the leading contributor of income at $194,296,000, followed by poultry at $79,439,000, and cattle at $65,284,000. These three commodities represent 45% of the total agricultural value. Merced ranked fourth in the state for all livestock, poultry, and apiary products in 1979. With more than 400 dairies, Merced is the fifth largest producer of milk with about 9% of the total production in the state. The remaining leading commodities are alfalfa ($46,455,000), almonds ($43,740,000), cotton ($35,638,000), sweet potatoes ($22,108,000), tomatoes ($20,846,000), and sugar beets ($18,770,000).

ACREAGE DEVOTED TO CROPS: According to the 1982 Agricultural Commissioner's Report, 1,045,095 acres were in crops, 61% in dry and irrigated pasture. Land devoted to livestock production is generally located in the foothills and valley pastures. Field crops accounted for 27% of harvested acres in 1982, orchards 8%, and vegetable crops nearly 4% of the total.

FARM SIZES: Data from the 1982 Census of Agriculture, Merced County, provides some insights on the characteristics of persons engaged in agriculture. In that year, the average farm size was 393 acres, compared to the statewide average of 390 acres. (Farm size is defined as the amount of land owned and rented by the farm operator minus the amount of land rented to others.) As shown in Table 1, 40% of all county farms are between 10 and 49 acres in size. While no data was available from 1982, the 1978 Census reported that farms between 10 and 49 acres in size accounted for only 6% of the harvested cropland for the year. On the other hand, farms of more than 2,000 acres, represented just 4% of the farms yet harvested 30% of the cropland.

Using data from the 1982 Census, it is possible to formulate a basic picture of farming in the county. Table 2 indicates that over one quarter of all farms had yearly sales of less than $5,000 in 1982. Of the 2,951 farms in the county, 2,772 or 94% were owned by individuals, families, or partnerships. The 164 corporate farms (including 148 family held corporations) totaled over 229,000 acres, 20% of the county farmland. Thirty-seven percent of the farm operators reported a principal occupation other than farming, and 39% reported working 100 days or more off the farm. Table 3 presents data on the tenure and organization of Merced County farms.

Table 1: FARMS BY SIZE

Farms by Size	1982 Number	1982 %	1978 Number	1978 %
Less than 10 Acres	452	15	324	11
10 to 49 Acres	1185	40	1201	41
50 to 179 Acres	695	24	703	24
180 to 499 Acres	307	10	356	12
500 to 999 Acres	130	4	143	5
1,000 to 1,999 Acres	80	3	85	3
2,000 Acres or More	104	4	102	4
TOTAL	2951	100	2914	100

SOURCE: 1982 Census of Agriculture, Merced County

Table 2: FARMS BY VALUE OF SALES

Farms by Value of Sales	1982 Number	1982 %	1978 Number	1978 %
Sales of $ 20,000 or More	1477	50	1399	48
$250,000 or More	478	16	342	12
$100,000 to $249,999	313	10	337	11
$ 40,000 to $99,999	343	12	423	15
$ 20,000 to $39,999	343	12	297	10
Sales of Less than $20,000	1474	50	1515	52
$ 10,000 to $19,999	320	11	310	11
$ 5,000 to $ 9,999	297	10	336	12
$ 2,500 to $ 4,999	857	29	869	30

SOURCE: 1982 Census of Agriculture, Merced County

Table 3: FARMS BY TENURE AND ORGANIZATION

Type of Tenure	1982 Number	1982 %	1978 Number	1978 %
Full Owner	1988	67	1960	67
Part Owner	598	20	585	20
Tenant	365	13	369	13
Type of Organization				
Individual or Family	2343	79	2322	80
Partnership	429	15	463	16
Corporation	164	6	120	4
Other	15	-	9	-

SOURCE: 1982 Census of Agriculture, Merced County

A final point in the economic picture of farming in Merced County concerns the intensity of use of the land. In other words, getting more production and, therefore, more value out of each acre farmed. Advances in the use of pesticides, chemicals, irrigation, strains of plants and other technologies have helped increase per acre yields. The climate of the San Joaquin Valley also allows double cropping in some areas.

TRENDS: Table 4 shows the value of agricultural products from 1973 to 1982, and Table 5 illustrates these values adjusted for inflation. Table 6 shows acreage harvested for all field, seed, vegetable, and fruit and nut crops from 1973 to 1982. An important trend can be seen for increases in vegetable, and fruit and nut crops acreages. Vegetable crops were up from 27,717 acres harvested in 1972 to 37,260 in 1982, an increase of 34%. Land devoted to fruit and nut crops increased by 22% during this period from 67,408 acres in 1973 to 81,962 acres harvested in 1982. Although accurate figures are unavailable, "double cropping" appears to be a factor in the increase of harvested acres.

Another important change is the reduction in acreage of field crops (including pasture) in recent years. From 1,112,635 acres harvested in 1973 to 922,860 acres in 1982, 17% reduction. No definitive studies have been made of the relationship between growth in fruit, nut, and vegetable crops and the decline in acres of land devoted to field crops. It is likely that lands taken out of pasture and rangelands have been converted to crop production. Specifically, pasture has been converted to orchards and field and vegetable crops.

Economics is the major factor explaining those conversions. A farmer is always seeking to maximize profits and reduce costs. If a certain commodity is in short supply and bringing a higher price, farmers will act to convert their lands and produce that commodity until supply coincides with demand and the price stabilizes. As an example, almond orchard acreage has risen from 32,947 acres in 1973 to 48,510 acres in 1982. At the same time, the price has varied from $.65 per lb. in 1975-76, to $1.40 to $1.60 from 1978 to 1980. The price declined in 1982 to $.90 per lb. Acreage devoted to almonds will continue to rise as new markets are opened up, as over 60% of California almonds are shipped to foreign markets.

Additional factors in explaining diminishing harvested acreage are weather problems, labor disputes, government transfer payments (PIK Program), and conversion of agricultural lands to urban uses. Marginal agricultural land surrounding cities is taken out of production when rising land values discourage continued farming.

EMPLOYMENT: Agriculture is the source of employment for 23% of the county's civilian labor force. Foster Farms, the largest poultry processor in the west, employing 2,800 people, is headquartered in Merced County. The Gallo Winery employing 100 people, the biggest winery in the world, has production facilities in the Livingston area. In 1982, annual average farm employment fell by 375 to a level of 10,450 as low as it has been since 1978. The number of workers engaged in crop production activities increased slightly during 1982. Employment in agricultural services, however fell by 16.3%. This reduction is attributed to inclement weather and market conditions during 1982. Introduction of the federal PIK Program also acted to reduce agricultural services employment, as less services were in demand from farmers who chose not to grow selected commodities. The recent trend in agricultural

Table 4: Ten Year Summary - Value of Agricultural Products

Item	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Bee Industry	$ 1,595,400	$ 1,575,500	$ 1,085,000	$ 1,493,200	$ 1,600,900	$ 2,021,000	$ 2,006,000	$ 2,923,000	$ 2,812,000	$ 3,616,000
Field Crops	78,936,600	112,474,600	101,968,000	123,160,800	111,041,500	96,344,000	157,795,000	191,239,000	179,656,000	171,140,000
Fruit & Nut Crops	69,085,560	[1]58,862,420	[1]55,799,000	74,971,100	100,481,500	86,243,000	155,830,000	152,584,000	[1]118,586,000	109,865,000
Livestock & Poultry	83,386,000	68,155,300	[1]103,548,000	119,051,800	119,294,800	132,959,000	182,652,800	191,226,000	184,181,000	170,649,000
Livestock & Poultry Products	72,020,000	75,985,600	89,559,000	99,300,600	104,095,500	118,519,000	[1]143,111,000	171,548,000	200,733,000	208,651,000
Nursery Products	5,720,000	4,056,000	5,023,000	4,302,000	6,430,000	7,336,000	12,011,000	15,734,000	9,932,000	9,214,000
Seed Crops	842,000	1,335,400	2,972,000	3,343,000	3,683,000	2,643,000	3,228,000	3,012,000	2,539,000	2,015,000
Vegetable Crops	32,669,000	[1]35,254,800	47,704,000	40,089,000	60,142,800	50,828,000	51,419,000	65,831,000	66,438,000	67,880,000
GRAND TOTAL	$344,254,560	$357,699,620	$404,956,000	[1]$465,711,500	$506,770,000	$496,893,000	[1]$708,052,800	$794,097,000	[1]$764,877,000	$743,030,000

1 Revised

Source: Agricultural Commissioner, Merced County Annual Crop Reports.

Table 5: Value of Agricultural Products - Adjusted for Inflation - 1973-1982

Year	[1]Value of Agricultural Production	% Change from Previous Year	[2]Consumer Price Index (1967 = 100)	Value Adjusted for Inflation (1967 Dollars)	Adjusted % Change from Previous Year
1973	$344,254,560	-	131.5	$261,790,530	-
1974	357,699,620	+ 4	144.4	247,714,410	- 5
1975	404,956,000	+12	159.1	254,529,220	+ 3
1976	465,711,500	+13	168.0	277,209,220	+ 8
1977	506,770,000	+ 8	180.8	280,293,140	+ 1
1978	496,893,000	- 2	197.8	251,209,800	-12
1979	708,052,800	+43	214.6	329,940,720	+24
1980	794,097,000	+12	247.3	321,106,750	- 3
1981	764,877,000	+ 4	279.0	274,149,460	-17
1982	743,030,000	- 3	300.0	247,676,660	-11

[1]Source: Merced County Annual Crop Report

[2]U.S. Department of Labor, Bureau of Labor Statistics
San Francisco-Oakland CPI

Table 6: Ten Year Summary - Acres Harvested

Crop	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Pasture	863,000	837,200	834,700	710,974	690,791	685,000	685,000	665,000	639,000	640,000
Other-Field	249,635	290,531	245,248	287,276	248,995	273,778	290,346	286,037	316,984	282,860
Seed	2,424	2,574	5,244	6,438	8,586	7,036	5,965	5,555	3,684	3,013
Vegetable	27,717	22,597	28,777	25,270	32,350	33,515	34,618	29,088	28,802	37,260
Fruit & Nut	67,408	72,364	76,560	76,949	79,894	74,547	78,264	81,078	81,441	81,962
TOTAL	1,210,184	1,225,266	1,190,529	1,106,907	1,060,616	1,073,876	1,094,193	1,066,758	1,069,911	1,045,095

Source: Agricultural Commissioner, Merced County Annual Crop Reports.

employment will continue to decline according to the Employment Development Department (EDD). Although agricultural production and total acreage under cultivation is expected to increase, rising operating costs will force many growers to turn toward the increased usage of mechanization, thereby reducing labor needs. This will result in a change in acreage allocations of various crops. Less land will be used for labor-intensive crops, while more will be devoted to crops and commodities that require less labor and yield higher prices.

A little more than two-thirds of the manufacturing workers (5,300 employees) are employed in the food processing sector. Between 1981 and 1982, food processing added 375 jobs, a significant increase over recent average yearly gains of about 250. Because of the weakness for agriculture in 1983, the EDD forecasts a gain of only 50 in food processing for the year, and a further gain of 100 in 1984. Recent economic problems of some area canners may slow the already weak employment growth in the food processing sector. Agriculture also contributes to employment in transportation, wholesale and retail trade services. These sectors were all weak in 1982, as a result of the downturn in agriculture and the economy as a whole during the year.

Employment growth in the agricutural industry will come about more from the expansion of existing firms rather than from new firms locating in the county. Industrial development and expansions are due to the comparative advantage of firms to locate in Merced County rather than elsewhere. One advantage the County could offer is the issuance of Industrial Revenue Bonds (IRB) for attracting new firms and expansions with low cost financing.

PROCESSING VALUE: Agriculture's contribution to the local economy includes not only the value of all crops grown in the county, but includes as well, the "value-added" of processing both locally grown and imported commodities. Imported commodities are crops and products grown outside the county and then shipped into Merced for processing. Merced County agricultural industries are involved in several different aspects of crop production and processing. Local firms aid farmers by: shipping, packing, processing, and storing various crops and commodities.

The method of measuring agriculture's total contribution and flow of dollars through the local economy is with an Input-Output Model. An Input-Output Analysis of the economy of a specific geographic area results in an Input-Output Model which depicts the economy as a system of interacting economic sectors and shows the magnitude of these relationships. Once established, dollar changes in one sector can be traced to determine their impacts or resulting changes in another sector.

Input-Output Models have been developed for several counties and regions in the state by the University of California Cooperative Extension, Berkeley. A model for the San Joaquin Basin was completed in 1976 by the U.C. Cooperative Extension, and could be a source of technical data for such a study of Merced County. It would be useful to prepare a detailed Agricultural Impact Study for the county. Utilizing services of the local U.C. Extension office, the Agricultural Commissioner, and other county departments, an Input-Output Model could be constructed for the local economy. Such a study would accurately measure agriculture's total contribution to the economy through crop production, processing, transportation, and other related services.

An agricultural impact study was prepared for Stanislaus County in 1981, and in 1983 for San Joaquin County. Findings of the Stanislaus County study concluded that the value of agricultural production and processing was nearly five times the amount attributed to the value of crops in the annual Agricultural Commissioner's Reports. The difference was the result of an "economic multiplier" effect of basic jobs (such as agriculture) creating nonbasic industry jobs (wholesale and retail trade). For every dollar earned by the basic sector, "X" number of dollars are generated in the local economy by the service industries. For example in San Joaquin County, fruit sector sales of $65.17 million resulted in sales of $0.31 million in the dairy sector, $6.11 million in the agricultural services sector, $1.19 million in the transportation sector, etc. And for the State as a whole, the California Crop and Livestock Reporting Service estimates that for every dollar of farm receipts, three additional dollars are generated in the State's economy.

FACTORS INFLUENCING AGRICULTURAL PROFITS

LAND: The value of California farm real estate doubled between 1977 and 1981. As shown in Table 7, San Joaquin Valley truck and vegetable cropland rose from $1,135 an acre in 1972 to $4,570 an acre in 1982. Real estate prices have been rising steadily during the last two decades for three major reasons: income generating potential of the land; availability of credit; and inflation.

Real estate prices began to escalate in response to available credit, increasing productivity, and as an investment against inflation. Dropping farm income in recent years has slowed the increase and in some instances farm real estate values have declined. This has been most notable for almond acreage in the Central Valley due to substantially lower commodity prices received by almond growers. As a result of the lower prices, the economic return of almond acreage dropped $750 per acre from 1980 to 1982. Farm real estate values should generally continue to increase in the foreseeable future. Farmland is still viewed as a hedge against inflation, expansion plans of existing farms, and rising farm income, will all act to increase farm real estate values.

Urbanization, and its effect on agricultural land values and production costs, is a major concern of the farm sector. Farmland taken out of production probably will never be recovered, thus, forcing cultivation of marginally productive land at higher costs to farmers and ultimately the consumer. County development policies, through zoning and general plan designations, also affect farm real estate values. Land zoned for Agricultural-Residential uses in the Merced-Atwater area commands prices up to $35,000 to $40,000 per one-acre lot. Whereas a single acre of productive almond orchard land may be valued at only $7,000. The acre value of a certain crop depends upon the productivity of the land and the dollar value per unit of output.

WATER: Irrigation water costs to Merced County and other San Joaquin Valley farmers varies greatly. Water is available to farms through an extensive canal system and by groundwater pumping. Both the federal Central Valley Project, and the State Water Project provide water to local farms. Merced County is presently served by no less than 25 water and irrigation districts, irrigating 456,484 acres according to the 1978 Census of Agriculture. Surface water delivery costs also vary between the different districts. In 1979, the cost per acre foot of water ranged from $0.96 per acre foot for the Turlock

Table 7: Average Value of Land per Acre

	San Joaquin Valley[1]		
	1972	1981	1982
Irrigated:			
Truck & Vegetables	$1,135	$4,190	$4,570
Intensive Field Crops[2]	980	3,590	3,920
Extensive Field Crops[3]	815	3,180	3,640
Pasture	650	2,140	2,420
Non-Irrigated:			
Cropland	420	1,480	1,710
Pasture	375	1,050	1,310
Rangeland	250	620	770

[1] Includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern Counties.
[2] Includes such field crops as: alfalfa, cotton, sugar beets.
[3] Includes such field crops as: grains, dry beans, rice, wheat (U.S. Department of Agriculture definitions).
Source: Security Pacific Bank, California Agriculture, 1982, page 35.

Irrigation District serving the Hilmar-Delhi area, to $20.80 per acre foot for the San Luis Water District in the Los Banos area. As a comparison, pumping costs for five wells monitored in Merced County during 1978, by the Department of Water Resources, varied from $12.62 to $18.06 per acre foot.

Water demand by the various crops grown in the county, and the cost per acre foot of water, may influence the profitability of certain farming operations. Data collected by the Merced Irrigation District (MID) shows the varying water demand of different crops. The cost per acre foot of irrigation water and the water demand of crops could influence where those crops would be grown. As an example, you would expect crops that require a lot of water to be grown in areas that have lower water rates than in areas where water is significantly more expensive. In the San Luis District, you would not expect to find large acreages devoted to growing crops with high water demand such as: rice, onions, peaches, or irrigated pasture. However, you might find such crops as cotton or grain grown which require less water than most other field or vegetable crops. In areas where the water costs are comparable, the influence would not be as great in determining which crops would not be profitable.

DEBT: California farm debt has tripled since 1973, and doubled since 1977. The survival of the farm in the future will greatly depend on its financial condition. There are two kinds of farm debt: real estate and non-real estate. Non-real estate debt has been growing faster than real estate debt since 1977. Non-real estate debt consists primarily of 1) short-term loans for crop production or operating expenses, and 2) machinery and equipment loans.

Farm income has remained soft over the last few years while inflation, credit, and production costs have continued to rise. Conversation with the Federal Land Bank office in Merced indicates that farm loans have been made for operating expenses and not for financing cropland expansions. It is difficult to compute the average debt load for the typical farm in Merced County. Farms, as with other businesses have different capabilities for carrying debts. Operations that are capital intensive (dairies, orchards, vineyards, etc.) can more easily carry a larger debt load than a farm devoted to pasture or field crops. The same is true for a farmer that has inherited his land with no outstanding long-term debts. He would be more able to increase his debt load for expanding operations than a farmer who had to borrow heavily to purchase his land.

ENERGY COSTS: Merced County agriculture is highly mechanized, with diesel or gasoline powered equipment being used in most phases of farm operation. Energy costs account for a much larger proportion of the total production expenses for most crops than they did only a few years ago. Agriculture is dependent on fossil fuels and electricity in three areas: First, its production techniques demand energy inputs: fertilizer, pesticides, and fuel for mechanized planting and harvesting. Second, its demand for irrigation water requires large amounts of electric power for pumping. Third, its distance from markets and processors necessitates relying on a transportation system that is dominated by liquid fossil fuels (diesel, gasoline). Agriculture appears to be particularly vulnerable to rising energy prices, especially as they are reflected in the costs of water pumping, direct fuel use, and fertilizers.

LABOR COSTS: Rising labor costs in recent years have helped to push farm prices higher. Unionization among farm workers in the 1970's made possible significant strides for higher wages and other benefits. As a result, the cost of labor for California farm workers has been higher than the rest of the nation. As of July, 1982, the average wage rate was $4.89 per hour for California workers, compared with $3.96 per hour nationwide.

Efforts to increase mechanization on the farm has been met with some resistance from farm labor groups. Pro-labor groups contend that there have been many adverse impacts resulting from mechanization including displacement of workers and small family farmers, increased food prices to consumers, a deterioration of the quality of rural life, and a disruption of farm worker collective bargaining. However, pro-mechanization interests contend that mechanization has many positive benefits: reducing the toil of farm labor; increase the productivity of farm workers and farm enterprises; evening out the peaks and valleys in farm labor employment; reducing the amount of crop loss during harvest; and increasing the quality of produce by harvesting on a more timely and effective basis.

TAX RELIEF MEASURES

THE WILLIAMSON ACT: The California Land Conservation Act of 1965, better known as the Williamson Act, is the most widely used farm property tax relief program. It is a voluntary program where farmland owners enter restrictive use contracts with local governments. The subsidy is provided through a reduced property tax assessment resulting from valuing contracted land on the income it is capable of producing from agriculture rather than its fair market value for other purposes.

Prior to offering Williamson Act contracts, the Board of Supervisors sets the boundary of the preserve, the minimum farm size which can enter a contract and the minimum time the contract runs for (usually 10 years). The County Assessor determines the new assessment level by dividing the net income of the land, generally its rental value, by a special capitalization rate based on the rate of interest on long-term U.S. Government bonds (presently about 13%). For example, an acre of farmland that sold for $5,000 would be taxed at approximately $50 per year (1% of market value). If this land rents for $200 per year, the land valuation for Williamson Act purposes would be about $1,500, or a tax of only $15 a year. Cities have several options regarding the Williamson Act; they can offer contracts independent of the county, they can honor the county's contracts when land is annexed to the city, or they can protest any contract the county enters into within one mile of the city, giving them the right to cancel the contract immediately upon annexation.

There are two ways to terminate a contract: through cancellation or by filling a notice of nonrenewal. To cancel a contract, the landowner must submit a request with the local government. A public hearing is held where the governmental body must find that cancellation is in the public interest. A cancellation fee equal to 12.5% of the fair market value (cancellation valuation) must also be paid, unless such fee is waived or reduced. If approved, the cancellation is effective immediately upon recording a notice of cancellation. The second method to terminate a contract is for the landowner to file a "notice of nonrenewal". While there is no cancellation fee under

this approach, the contract takes nine years to expire with an additional one-ninth of the full market tax rate added each year so that by the tenth year the full rate applies. The county or city can also file a notice of nonrenewal resulting in a somewhat modified cancellation process.

In order to compensate participating counties and cities for lost revenue, the State makes subvention payments. This ranges from $1 to $8 per acre for prime farmland depending on its proximity to a city, and 40 cents per acre for all other land.

The tax relief and agricultural land preservation effects of this Act have been widely debated. However, a recent study of the Act's tax consequences was conducted by the State Department of Conservation focusing on the effects of Proposition 13. The Department of Conservation reported that the average tax savings under the Act are 62% compared to the Proposition 13 (1975) valuation, and 83% compared to the 1981 fair market value. Substantial differences in tax savings were found depending on the crop, the county, and the proximity to urban developments. The greatest savings was on grazing land in San Luis Obispo County, and the lowest was zero on several crops in Tehama County (a special added tax relief can be applied in such instances ranging between 10% and 30% savings).

In a separate study conducted by the Stanislaus County Assessor's Office, contracted land was found to pay about 25% of the normal tax level. And after the state subvention payments were received, the county lost approximately $3.6 million in revenue in 1981. Similar studies by the Merced County Assessor could be undertaken to estimate the potential savings to farmers, and potential revenue loss to the county.

In the final analysis, if the goal is to improve the financial viability of farms, the Williamson Act offers a substantial reduction in property taxes in most cases. The cost of this program, however, could be substantial and may require the county to reduce services.

OPEN SPACE AND CONSERVATION EASEMENTS: Other programs which use tax incentives to keep farmland in production include open space and conservation easements. Under the terms of the Open Space Easement Act of 1974, a conservation easement can be granted by the government or by a private land trust (usually a non-profit community based organization formed to preserve farmland and open space) whereby the subject property becomes "enforceably restricted" to agricultural and related uses. The easement runs for a minimum of 10 years (with automatic renewal), or may be granted permanently. It can only be abandoned by application of the landowner (or by government through purchase of the property).

The easement must be consistent with the Open Space Element of the local general plan and be approved by the Planning Commission and Board of Supervisors after public hearings. The tax basis is the same as under the Williamson Act. Where the easement was granted permanently, an income tax savings may also be realized by the landowner for the development value of the land. In California, the Conservation Easement Act of 1979 was enacted to allow the granting of conservation easements without requiring public hearings. Under this Act, landowners who donate their development rights permanently may be eligible for charitable deductions on their federal and

state income taxes, concessions on estate taxes where the property value has been reduced, and lower property tax assessments. Conservation easements have been used by the State Coastal Commission, and in limited coastal areas by local land trusts.*

*The Conservation Easement in California was used as a reference for this subject. Written by Thomas S. Barnett and Putnam Livermore for the Trust for Public Land 1983 (Island Press: Covelo, CA).

B. SOILS ANALYSIS

Perhaps the most important factor affecting agricultural productivity in the county is soil quality. This section looks at how the soils are evaluated and classified and describes the quality of soils around the existing urban areas (Specific Urban Development Plans, SUDP's). A study of the potential growth that could be accommodated in these urban areas is also presented.

MAPPING PROCEDURE

Soils in Merced County have been analyzed and categorized by the U.S. Soil Conservation Service. The soils in the County east of the San Joaquin River were recently reclassified under the California Department of Conservation's Farmland Mapping and Monitoring Program. For the county lands west of the river, the soil survey was completed in early 1983, and is presently being reviewed for accuracy. With the exception of "prime farmlands" which have been identified, it will be a year or more before these soils are classified under the Farmland Mapping and Monitoring Program.

Because of the difference in the State's mapping program for the eastern and western county, the Planning Department developed an alternate method of classifying the less than prime soils in the west county. In order to better appreciate what the soil classifications represent, a brief description of the Important Farmland Map Soils Classification follows.

"Prime" farmland requires good soil quality and climate conditions, it must be irrigated, permeable to water, have acceptable acidity or alkalinity levels, and acceptable salt and sodium content, with few or no rocks, and can economically produce sustained high yields when treated and managed according to modern farming methods. Soils identified as "Farmland of Statewide Importance" are based on the same criteria though with slightly lower capability standards for measurement. "Unique Farmland" and "Farmland of Local Importance" are based on a soils present use to produce specific high value crops which are important to the state and local economy, respectively.

A modified version of this classification system has been applied to the west county. For a two mile radius around the SUDP's, a detailed breakdown of the soils has been completed categorizing the non-SUDP land as "Prime", "Statewide Important/Unique", or "Other." The "Prime" soils are based on the same tests as for the east county. The "Statewide Important/Unique" classification was created by combining the non-prime Capability Class III and IV soils, both of which are suitable for cultivation. The "Other" soils category includes the Capability Class VI through VIII soils which have many limitations for cultivation and, except for rare cases, are not used for crop production.

The remainder of the west county has been separated into those areas primarily under cultivation and those areas not cultivated. This provides a rough indication of soil quality as most areas with cultivatable soils are under active crop production. Although grazing lands have not been mapped, much of the hills west of Interstate 5 and in the east county area are used for this purpose. The information for mapping cultivated areas was compiled by the State Department of Water Resources "Land Use Inventory" in January 1981.

ANALYSIS OF SOIL QUALITY AND URBAN GROWTH AS IDENTIFIED ON THE IMPORTANT FARMLAND MAP

Merced County is blessed with a large amount of prime soils, reflected directly in the high economic value of agricultural production in the county. This high quality soil, however, poses a problem for urban growth. Unfortunately, the best soils for crop production are also the easiest to develop and build upon because of superior slope and drainage qualities.

Within the county, all the major and most of the minor SUDP's are located on Prime or Statewide Important soils. Winton, Le Grand and Planada are entirely surrounded by prime soils. Most other SUDP's contain a mixture of soil classes, but with Prime and Statewide Important dominant (Refer to Figure 2).

Areas around SUDP's where lesser quality soils exist include: northern and portions of southern Merced City; eastern Los Banos; scattered areas of Local Important soil around Atwater; Local Important soil south of Delhi bordering Highway 99; poor soils to the west and north of Volta; Local Important soil south and west of Stevinson; and all areas around Snelling except to the northwest. What this soil survey reveals is that, except for limited locations, the soils around all SUDP's in Merced County are of a very good agricultural quality. The use of these soils for urban development represents a loss of some of the most productive land in the county.

To analyze the demand for urban development on these soils, a study was conducted to estimate the amount of growth which could be accommodated within the existing SUDP's. (See Table 8) Utilizing aerial photographs from 1979, rough calculations were applied to the vacant land within the SUDP's with sewer service. This figure was then multiplied by a density of five dwelling units per acre which averages area for roads and vacant land in all zoning and general plan classifications. Population estimates are based on the most recent trend of three persons per dwelling.

This analysis reveals that the existing SUDP's with public sewer service could accommodate about 347,550 additional people, 3.7 times the 1980 population. The present SUDP size for the rapidly growing cities could accommodate the following increases: Atwater - 30,750 additional people, not including the Rural Residential Centers; Dos Palos - 13,620 additional people; Livingston - over 10,000 additional residents; and Merced - 106,050 additional people, also not including the Rural Residential Centers.

Unincorporated SUDP's with high growth between 1970-1980 could accommodate the following population increases: Delhi - 2,925; Hilmar - 2,400; Planada - 7,305; and Winton - 9,405. Two additional SUDP's with large amounts of vacant land, but which have experienced minimal population growth in the last 13 years include Los Banos, providing enough vacant acreage to accommodate over 100,000 people, and Santa Nella with a present population of only 500, but containing enough land for 35,100 additional people.

The conclusion drawn from this analysis is that more than enough land is provided within the existing SUDP boundaries to accommodate projected growth well past the year 2000. From this, it appears that expansion of urban uses onto productive soils outside the SUDP's represents a premature conversion of agricultural land. In addition, because of their large size, growth within the larger SUDP's should be directed toward areas of poor soils wherever possible. Two primary examples for this would be growth toward the north in the Merced SUDP and growth in the eastern Los Banos SUDP.

Table 8:

VACANT SUDP LAND*
(ALL SUDP'S WITH SEWERS)

SUDP	1980 POPULATION	VACANT AREA (ACRES)	POTENTIAL DWELLINGS[1]	POTENTIAL POPULATION INCREASE[2]	POTENTIAL INCREASE IN PERCENT
Atwater	17,530	2,050	10,250	30,750	175%
Delhi	2,832	195	975	2,925	103
Dos Palos	3,123	908	4,540	13,620	436
Franklin/Beachwood[3]	2,426	186	930	2,790	115
Gustine	3,142	626	3,130	9,390	387
Hilmar[4]	1,706	160	800	2,400	140
Le Grand	904	135	675	2,025	224
Livingston	5,326	677	3,385	10,155	190
Los Banos	10,341	6,770	33,850	101,550	982
Merced[5]	36,499	7,070	35,350	106,050	290
Midway	699	586	2,930	8,790	1,257
Planada	2,406	487	2,435	7,305	303
Santa Nella	488	2,340	11,700	35,100	7,192
Snelling	314	220	1,100	3,300	1,050
South Dos Palos	765	133	665	1,995	260
Winton	4,995	627	3,135	9,405	188
TOTAL	93,496	23,170	115,850	347,550	371

* Based on aerial photographs of 1979.

1) Calculated at 5 dwellings per vacant acre (this average compensates for roads, vacant non-residential land, and vacant multi-family residential land).

2) At 3 persons per dwelling.

3) Source: Franklin/Beachwood Community Specific Plan 1983 (does not include residential land).

4) Vacant SUDP residential land calculated in 1983.

5) Vacant city land (1,800 acres) estimated by City Planning Department, 1983.

GENERAL SOIL QUALITY

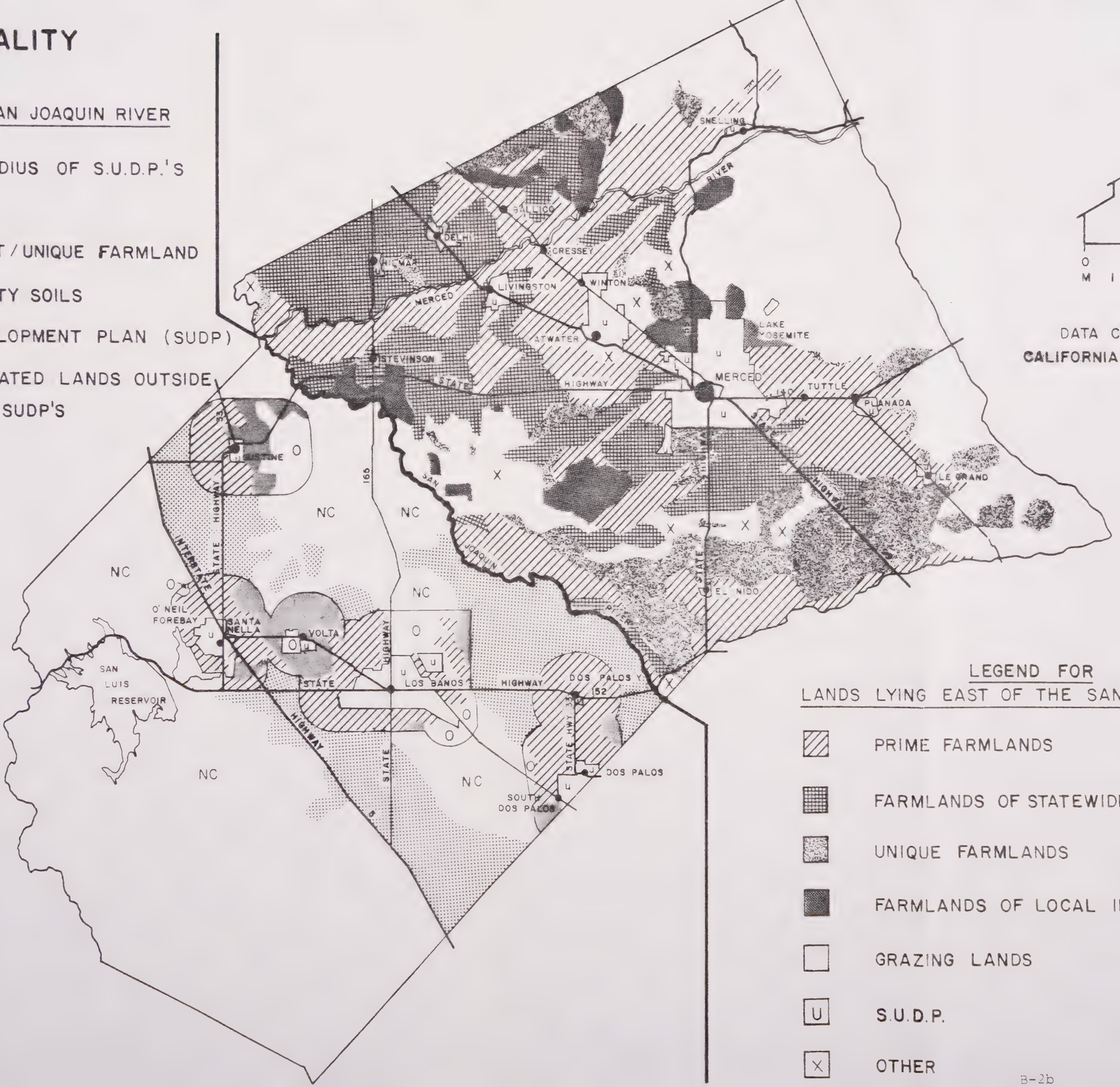
LEGEND FOR
LANDS LYING WEST OF THE SAN JOAQUIN RIVER

SOILS WITHIN A 2 MILE RADIUS OF S.U.D.P.'S

- PRIME FARMLANDS
- STATEWIDE IMPORTANT / UNIQUE FARMLAND
- O — OTHER LESSER QUALITY SOILS
- U — SPECIFIC URBAN DEVELOPMENT PLAN (SUDP)

CULTIVATED AND NON-CULTIVATED LANDS OUTSIDE OF A 2 MILE RADIUS OF SUDP'S

- CULTIVATED LANDS
- NC — NON-CULTIVATED



N

0 3 6
M I L E S

DATA COLLECTED BY
CALIFORNIA DEPT. OF CONSERVATION

LEGEND FOR
LANDS LYING EAST OF THE SAN JOAQUIN RIVER

- PRIME FARMLANDS
- FARMLANDS OF STATEWIDE IMPORTANCE
- UNIQUE FARMLANDS
- FARMLANDS OF LOCAL IMPORTANCE
- GRAZING LANDS
- U — S.U.D.P.
- X — OTHER

FIGURE 2

C. CONVERSION OF AGRICULTURAL LAND

The conversion of agricultural land to other uses and from one agricultural use to another reflects the land use trends in the county's agricultural sector. As discussed previously in the Economics of Agriculture section, farmers are always seeking to maximize profits and reduce costs by converting their lands to produce the commodity offering the best return. This section looks at the location and rate of conversion of agricultural land to other uses, changes in agricultural production, and conflicts between farm and urban land uses.

LOCATION AND RATE OF CONVERSION

The conversion from agricultural to urban uses for land up to one mile from the major SUDPs and incorporated cities was estimated by comparing aerial photographs from 1967 and 1979. The conversion figures for each SUDP are displayed in Table 9. Lands were considered converted if the 1967 photo contained cropped or vacant native vegetation, and the 1979 photo showed structures or alteration for development such as grading and new roads.

A total of 3,650 acres was found to have been converted over these 12 years. An additional loss of 420 acres resulted from completion of Interstate 5 from Highway 152 to the southern county line. To estimate the magnitude of this conversion, two calculations were completed.

Table 9

CONVERSION OF AGRICULTURAL LAND BETWEEN 1967-1979 BY MAJOR SUDP

SUDP	ACRES CONVERTED	POPULATION CHANGE 1970-80	AVERAGE INCREASE IN POPULATION PER ACRE
Atwater*	792	5,890	8.9
Delhi	47	769	19.7
Dos Palos	56	627	13.4
Franklin/Beachwood	99	347	4.2
Gustine	39	349	10.7
Hilmar	90	596	7.8
Le Grand	0	N.A.	N.A.
Livingston	87	2,738	37.8
Los Banos	94	1,153	14.8
Merced*	2,160	13,829	7.7
Midway	17	N.A.	N.A.
Planada	0	350	N.A.
Santa Nella	60	306	6.0
Snelling	0	96	N.A.
South Dos Palos	0	123	N.A.
Winton	109	1,602	17.8
TOTAL	3,650	28,653	9.4

*Merced and Atwater totals include unincorporated Rural Residential Center lands developed at a density of one dwelling unit per acre.

As an indication of the relationship between population growth and agricultural land conversion, an average yearly conversion rate between 1967-1979 was calculated and compared to the average yearly growth in population between 1970-1980 for selected SUDPs. This provides a ratio for the average increase in population per acre of conversion. On the higher end was Winton which averaged 17.8 people per acre, roughly equivalent to the six dwelling units per acre permitted in an R-1 single family zone. The Merced area averaged 7.7 people per acre, Atwater averaged 8.9 people per acre and Hilmar was comparable at 7.8 people per acre. And Franklin/Beachwood averaged only 4.2 people per acre reflecting the large lot type of development that has taken place. An average of 9.4 people per acre converted was the mean increase in the large SUDPs. It should be noted that these figures are only approximations because various amounts of each SUDP's growth was accommodated through infill development rather than agricultural land conversion.

Another method of estimating the magnitude of the 3,650 acre farmland loss is through a comparison with the 1979 total non-pasture agricultural land of the county. (Non-pasture agricultural land was used because nearly all SUDP conversion was from harvested cropland.) This urban conversion represents only 0.7 percent of the total harvested acreage of 496,300. However, most conversion took place on the best quality soils.

Additional farmland has been converted as a result of rock and gravel removal operations in the northeastern county area near Snelling. While little land has been removed from agriculture to date, the potential for surface mining hundreds of acres in this region exists. In one example, previously productive agricultural land was excavated 10-15 feet to remove subsurface rocks for gravel. As part of the reclamation effort some of the topsoil was replaced on the land. But an attempt to return the land to agriculture by planting oats failed because insufficient drainage resulted from the excavation. Surface mining of the earth down to the clay hardpan layer, and replacement of two feet of topsoil was not adequate to provide proper drainage for crop growth.

The main problem in converting productive agricultural land into a nonfarmable area below surrounding grade is that it is unnecessary. There are many acres of rock tailings piled upon the surface in this area which is presently being used for gravel pits. Dredging out streams and the Merced River would also provide a source of gravel without the resultant loss in agricultural productivity, and could aid in drainage flow capacity.

LANDS TRANSFERRED FROM ONE AGRICULTURAL USE TO ANOTHER

Another aspect of conversion involves lands which were transferred from less to more intensive crop production. The foothills on the east and west side of the county have all been used as native pasture for cattle at one time or another. The trend of late, however, has been to convert these areas, as well as the native pasture lands in the southcentral county area to more intensive field, orchard, or vine crops.

This trend is the result of two main factors. Where good soils are located in the western foothills, the recent availability of water has allowed a wider variety of crops to be grown with a higher economic return to the farmer. Where poor soils are located, new technologies such as chemicals to reduce

acidity levels and heavy fertilizer use to improve the nutrients have upgraded the soil quality.

While this may be interpreted as a positive trend, there is a negative side in that most of the increase in intensive crop production has been made at the expense of grazing land. One result has been the increase in the use of feed lots for cattle raising.

CONFLICTS BETWEEN AGRICULTURAL AND URBAN USES

While the direct conversion of agricultural land to urban uses does not represent a large reduction in the total agricultural activity of the county, land parceled into small rural holdings which are too small for efficient farming may represent a larger actual loss. This includes the formation of rural "ranchettes" for residential use where 5 to 20 acres or more are taken out of agricultural production for a single home. These large estate homes are designed to take advantage of the peace and quiet of a rural setting; not for use as a ranch house to operate a farm.

Not only do small parcels remove previously productive farmland, but they also create incompatible uses that have a restrictive impact on the surrounding cropland. This involves complaints by non-farm residents about dust and noise from farm equipment, odors from livestock and fertilizer use, and disease-carrying insects. Specific urban-related impacts on individual farms include: trespassing, vandalism, and theft of farm equipment and crops, harassing of livestock by children and dogs, cut fences, and even fires.[1]

Another result from conversion of farmland to other uses is the impact on agricultural support businesses which go bankrupt from the loss of customers. This increases the hardship on the remaining farmers who must rely on services further from their operation.[2]

One of the largest problems resulting from the impacts of urban development in agricultural areas is the restriction placed on farms over the use of pesticides. The County Agricultural Commissioner must issue permits for designated restricted pesticide use to some 2,000 farmers a year. The main constraint in pesticide use is the impact on surrounding land uses such as streams, livestock, other crops, and game refuges. But residents of non-farm housing developments are the primary source of complaints about farm pesticide use.

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[1] William Toner, Saving Farms and Farmlands: A Community Guide, (Chicago: American Society of Planning Officials, 1978) pg. 1-2.

[2] Disappearing Farmlands: A Citizen's Guide to Agricultural Land Preservation, (Counties Research Foundation, 1980) Second Ed., pg. 7.

Additional source information on this subject can be found in: Daniel A. Mazmanian, "Agricultural Land Preservation in California: An Overview." California Farmlands Project Working Paper #1. (Claremont, CA: California Institute for Public Affairs, 1982).

The Agricultural Commissioner places one or more of the following restrictions on the farmers use of pesticides: 1) spraying limited by wind conditions; 2) no spraying within a given distance from neighboring uses (as listed above); 3) require that a different type of pesticide be used; 4) alter the type of application method (such as banning the use of cropdusting planes); and 5) limiting the number of days or hours when spraying is allowed.

A problem results when a farmer is so restricted in pest control because of neighbor's complaints, that crops are lost and eventually the farm may be completely taken out of production. The farmer then divides up his property to sell for more non-farm housing, thus impacting the next farm.

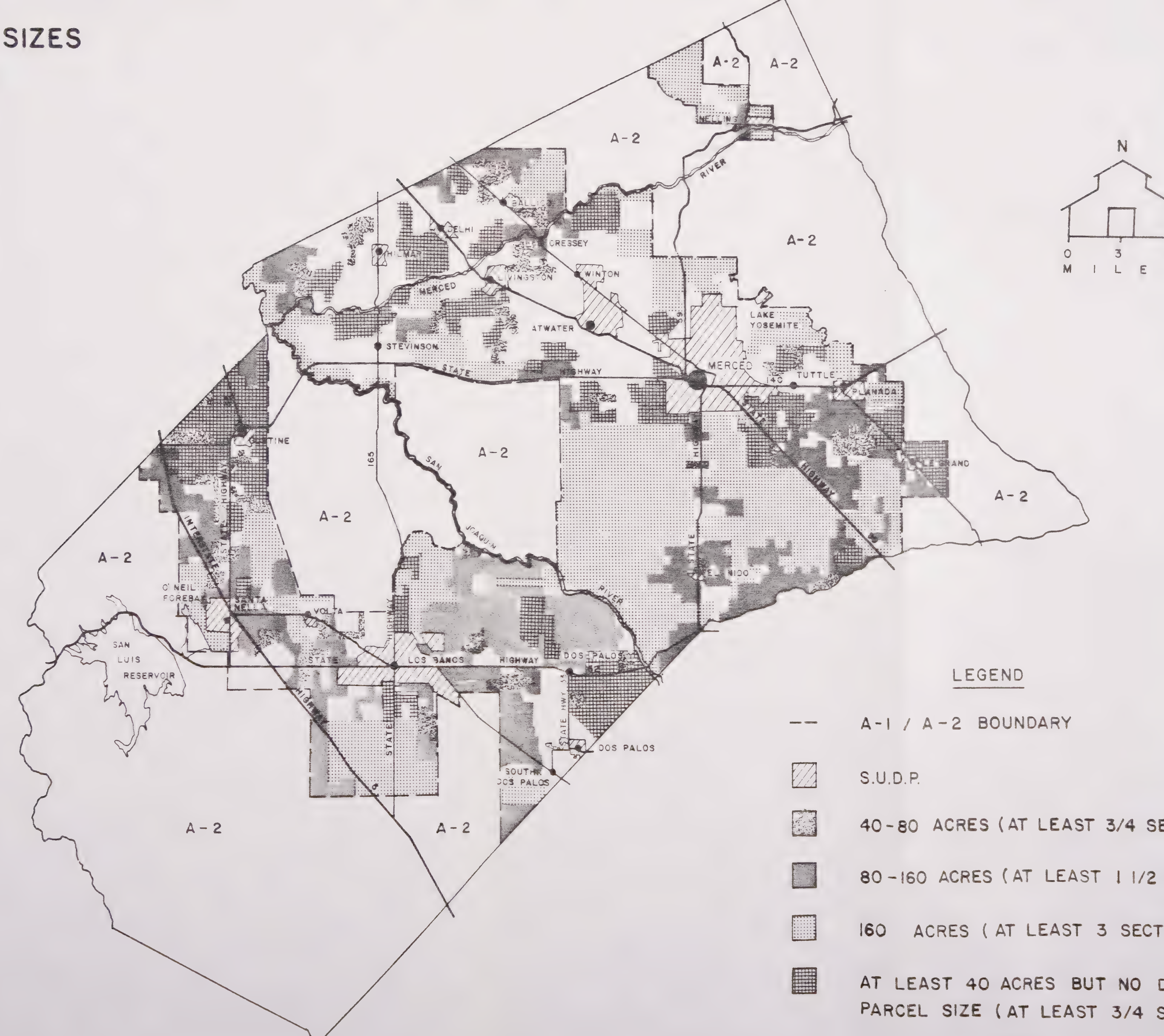
As with large rural ranchettes, the long range effect of restrictions on urban adjacent farmland may result in the loss of more agricultural land than from actual urban conversion.

SUMMARY

The low farmland conversion rate is a positive indication of the strength of agriculture in the county. Farmland loss in some of the other counties in the Central Valley has been much greater. For example, in San Joaquin County, 3,636 acres were converted between 1976 and 1979 (Merced's total for 12 years), and in Tulare County, an estimated 66,000 acres were converted between 1964 and 1969, although recent planning efforts have reduced this rate.

This does not mean that agricultural policies in Merced should be taken lightly. The severe economic hardships facing many of the county's farms requires as much public support and assistance as possible. And the introduction of more ranchette-type development increases the number of conflicts with agriculture and raises the speculative value of farmland beyond its potential agricultural income. It can be anticipated that there will be increased pressures for conversion in the future because of the area's relatively low housing prices.

EXISTING PARCEL SIZES IN THE A-1 ZONE



LEGEND

- — — A-1 / A-2 BOUNDARY
- S.U.D.P.
- 40-80 ACRES (AT LEAST 3/4 SECTION)
- 80-160 ACRES (AT LEAST 1 1/2 SECTIONS)
- 160 ACRES (AT LEAST 3 SECTIONS)
- AT LEAST 40 ACRES BUT NO DOMINANT PARCEL SIZE (AT LEAST 3/4 SECTION)

FIGURE 3

D. PARCEL SIZE ANALYSIS

The analysis of parcel sizes throughout the non-urban areas of the county reveals how farmland is divided between large and small farms and rural subdivisions. Understanding the extent to which an area is committed to agriculture is vital in the development of agricultural policies.

Given the same physical characteristics, areas with parcels 40 acres or larger are more likely to remain in active agricultural use than areas with parcels less than 20 acres. As pointed out in the preceding section, these smaller parcels are often purchased as rural estates or "ranchettes" and taken out of production. Present A-1 (20 acre minimum lot size) zoning reduces the threat of creating 10-15 acre ranchettes, but 20 acres is not large enough to discourage conversion to rural residential uses where land is inexpensive. In some counties, ranchettes of 100 acres have been created.

This section analyzes the distribution of parcel sizes within the county and discusses the implications for agricultural policy making.

EXISTING PARCEL SIZE SUMMARY MAP

The mapping for this portion of the Agricultural Element surveys those areas zoned A-1 with a given parcel size range. Parcels were measured on a quarter section basis (¼ mile square) except in cases where more than three parcels were present. These were mapped by eighth section (1/8 mile square).

The original categories used were: 0-10, 10-20, 20-40, 40-80, 80-160, and 160+ acres. Three of these categories were plotted on the "Existing Parcel Sizes in the A-1 Zone" map (See Figure 3) showing the geographic distribution of various parcel sizes 40 acres and above. An additional category was added for areas where no one parcel size was dominant, but where the minimum was at least 40 acres. (A few scattered parcels within each category may be smaller or larger than the range.)

Four of the most significant patterns found on the map can be summarized as follows:

1. About 245 square miles of land with 160 acre and greater sized parcels is located south and southwest of Merced extending to the county line. Most of the smaller parcels in this area are at least 80 acres in size. To the north and northeast of Merced parcels of 160+ acres are also dominant.

2. Except for a few areas containing 40 to 80 acre parcels, most land around the SUDPs along Highway 99 north of Merced consists of an assortment of parcel sizes generally less than 40 acres. Along Highway 140 and north of Ballico and Cressey large areas with parcels of 80-160 and 160+ acres exist.

3. On the west side of the county, most non-SUDP land contains a minimum of 40 acre parcels with 80-160 and 160+ acre parcels more dominant to the south - especially south of Los Banos and along the San Joaquin River.

4. Immediately to the west of the Snelling SUDP are 80-160 acre parcels and most of the remaining surrounding area consists of 160 and larger acre parcels including over 8 square miles to the northwest up to the Stanislaus County Line.

ANALYSIS OF 20 ACRE PARCELS

Parcel sizes are a major factor in the efficiency and profitability of farming, as significant as water availability and soil quality. The combination of parcel size and soil quality determines, to a major degree, a farms potential productivity.

As a means to determine the viability of a small farm, a study was completed of the nine top crops grown in the County in 1982. A comparison of production costs and revenues per acre was completed. (See Table 10) All production costs, except land cost which varies widely, were considered. This comparison assumes farmland that is fully paid for, not rented or mortgaged, and includes the cost of labor and management owed to the farmer for his effort.

The table reveals that with the most profitable crop, sweet potatoes, an average $26,780 return would be realized on a 20 acre farm - although it would probably be much lower because the average costs are based on a large farm where certain efficiencies of scale are realized. Wide yearly fluctuations in yield and sales price will further modify this figure for any given harvest. The next most profitable crop, peaches, would only provide a return on investment of $7,840 for a 20 acre farm. While a farmer could make a living on a small 20 acre farm growing a specific high value crop, the great majority of farms this size are part time operations that provide only a supplemental source of income. The average return on investment on a farm is around 4 to 4½%, much lower than most commercial ventures.

Further analysis was conducted to determine the viability of small farms like those permitted in the A-1 (20 acre minimum parcel size) zone. A representative of the Production Credit Association (PCA) was interviewed concerning lending policies for these smaller farms. Loans are usually 7-year "term" loans for capital improvements. The small farms do not require many one year "operating" loans for crop production, which according to the PCA representative, is because operating expenses are usually covered by the borrowers non-farm income sources. While the small farms are operated by the land owner in most cases, it is a secondary activity and source of income. As stated previously in the Economics of Agriculture Section, in 1982, 37% of Merced County farmers reported a principal occupation other than farming.

To determine the amount of land presently in 20-39 acre farms, a study was completed using the Existing Parcel Size Summary Map Analysis.

72,700 acres were found within this range in the non-SUDP A-1 (20 acre) zoned land areas. If all this land was in 20 acre ownerships, there could be 3,635 parcels; or if they were 39 acre parcels, there could be 1,864 parcels. As a means of comparison, the 1982 Census of Agriculture states that there were only 2,951 farms in Merced County of all sizes.

TABLE: 10

FARM INCOME ANALYSIS:
Average Sales Per Acre Contrasted to Estimated Production
Costs Per Acre of the Nine Top Crops in 1982 for Merced County

CROP[1]	1982 AVERAGE REVENUE/ACRE	1978-82 AVERAGE REVENUE/ACRE	1982-83 PRODUCTION[2] COST/ACRE	AVERAGE PROFIT/ACRE	1973-77 AVERAGE REVENUE/ACRE	1975 PRODUCTION[2] COST/ACRE	AVERAGE PROFIT/ACRE	1973-82 AVERAGE[3] PROFIT/ACRE
Alfalfa	$ 686	$ 602	$ 433	$169	$ 420	$ 265	$155	$ 162
Almonds[4]	950	1,318	1,178	140	877	489	388	264
Cotton	748	700	591	109	559	338	221	165
Sweet Potatoes	3,867	3,350	2,089	1,261	2,556	1,140	1,416	1,339
Tomatoes (Market)[5]	3,113	2,921	3,885	ø	2,566	2,238	328	ø
Tomatoes (Canning)	1,690	1,433	1,315	118	1,188	778	410	264
Sugar Beets	929	940	666	274	774	363	411	343
Corn (Grain)	433	416	421	ø	325	214	111	53
Corn (Silage)	448	369	294	75	217	150	67	71
Grapes (Wine)[4]	1,470	1,594	1,533	61	896	847	49	55
Peaches (Clingstone)[4]	2,856	2,909	2,255	654	1,750	1,620	130	392

SOURCE: Revenue per acre figures - Merced County Agricultural Commissioner. Production cost estimates - compiled by the Agricultural Extension, University of California, Merced County. Costs are based on an average productive farm size, 40-80 acres for most crops (120 acres for grapes).

[1]Crops are based on mature fields or orchards - not costs to establish crop.

[2]Used five year average yield per acre to calculate costs. All costs include preharvest, harvest, and depreciation, except land costs.

[3]Ten year profit per acre figures based on average yields and income per acre and sample production costs. Actual costs vary widely between farms because of differences in soil quality, efficiency, etc. In addition, large yearly flucuations in yield and crop prices (most notably with almonds and tomatoes) provide big profits one year and losses the next.

[4]Varying portions of most farms expenses are annual payments to repay costs of establishing the orchard or vineyard (especially the cost of trees or vines). The following interest costs were not included in the above figures although they are real costs to many farmers: Almonds - '82 = $446, '75 = $71.30· Grapes - '82 = $324, '75 = $115; and Peaches - '82 = $298, '75 = $80.

[5]Includes market tomatoes used for canning.

The 72,700 acres in the 20-39 acre parcel size range represents 17.8% of the total harvested cropland in 1982. (As supplied in the 1982 Agricultural Commissioner's Report: 408,000 acres were intensively cropped - not including pasture land.) The existing amount of small farms appears to provide enough opportunity for new and part time farmers to purchase land within the county.

Another concern involves the impact of increasing minimum parcel sizes on farmers who need to sell off portions (say 20 acres) of their farm in order to meet loan obligations in bad years. In most every area mapped showing groupings of 40, 80, and 160 acre parcels, all parcels are within the given range about the minimum parcel size (e.g., for 40 acre minimum, parcels are 40 to 79 acres in size, and for 80 acre minimums, parcels are 80 to 160 acres). There are presently no 20 acre parcels in these areas, which may suggest that even in bad economic years, none of the farmers had to sell off 20 acres to pay off debts. In addition, present Zoning Ordinance policy permits the splitting off of less than 20 acres if it is merged with a neighboring parcel, thus providing a source of financing.

SUMMARY

Many considerations must be made when determining minimum required parcel sizes for agricultural land. Whether or not new farms should be large enough to support full-time farming operations is of major concern. Where large areas of 40-80 or 80-160 acre parcels are identified, adjusting the minimum parcel size can be an effective means of encouraging conservation of agricultural land. By making it more difficult to create rural ranchettes, a primary cause of farmland conversion can be reduced.

E. AGRICULTURAL SUPPORT SERVICES

This portion of the Background Section focuses on the location and types of services which process and distribute farm products and supply the rural farm community with goods. While much of the processing of agricultural products is conducted in SUDPs - especially in incorporated cities - this section evaluates what services are provided outside the large SUDPs, where they are located, and what role the smaller SUDPs without public sewer and water systems play.

AGRICULTURAL SERVICES MAP

Figure 4 displays the distribution of four main types of operations serving the agricultural community which are located outside SUDPs and Highway Interchange Centers (H-I-Cs): Agricultural support services (suppliers, shippers, processors, etc.), convenience commercial operations, agricultural vehicle repair shops, and cropdusting operations.

The primary areas where agricultural support services are located include: Northwest of Merced on both sides of Highway 99; south of Merced on the east side of Highway 99; between Highway 152 and the San Joaquin River; and south of Los Banos to the west of Mercey Springs Road.

Retail commercial operations are almost exclusively within SUDPs. Those that are not can be found along the Highway 99 corridor or along other main highways including 152, 140, and 59. Most of these are markets with gas pumps. Only a few are service stations alone or restaurants and bars.

Agricultural equipment repair operations are also primarily within SUDPs. The few found outside them, however, are usually located very close by.

SMALL SUDP AND AGRICULTURAL SERVICE CENTERS

The list of commercial and agriculture-related services in each of the smaller SUDPs without public sewer and water service indicates their role as an urban center or as a service and convenience center for the rural agricultural community. The list below outlines the main uses in the 8 small SUDPs and their 1980 population:

* Ballico - Market with gas pumps, farm supply store, almond hullers, a school, fire station, and post office. Population - 176.

* Cressey - Market with gas pumps, auto repair business, elementary school, and fire station. Population - 211.

  Celeste - Market, two service stations. Population - 239. (Serves as residential suburb of Merced)

  Dos Palos Y - Two markets, three gas stations, a restaurant, an agricultural chemical service company, and several related agricultural businesses. Population - 302.

* El Nido - Market, service station, used car lot, fire station, and school. Population - 145.

* Stevinson - Market, gas station, two restaurants, auto repair shop, agricultural hauling business, school, and fire station. Population - 158.

* Tuttle - Market with gas pumps, tomato packing plant, agricultural vehicle repair and storage operation, and used car lot. Population - 20. (Recent reduction of SUDP to 15.5 acres)

* Volta - Grocery store/tavern with gas pumps. Population - 135.

*Indicates population level, location and uses which suggest role as an Agricultural Services Center (ASC) rather than an urban growth center (SUDP).

The County General Plan does not have different policies for small SUDPs and larger SUDPs with public sewers, even though they often serve different purposes. Where the population level and historical growth pattern is low or even declining, allowing a small SUDP to develop into an urban center with the introduction of sewer and water service could be harmful to the existing farming operations in the area.

The smaller SUDPs, especially those marked with an asterisk on the preceding list, presently provide agricultural and convenience commercial services to meet the needs of the rural population around the SUDP. The Land Use Element of the General Plan directs growth to areas where intensive land use exists or is taking place. SUDPs are created to provide for growth in an orderly and logical manner where proper public services are available. The smaller SUDPs without public services and which are not experiencing growth may be better designated as Agricultural Services Centers (ASCs).

Rather than providing a full range of urban services for a local population base, an ASC would serve in a capacity much like these small SUDPs do at present. An ASC would provide a location for agricultural services, farm support operations, and convenience commercial services for the rural population. A limited amount of housing for those supplying these services would be allowed, not to exceed a density of one dwelling unit per acre. The following list of uses were determined as appropriate by the Technical Advisory Committee for Agricultural Land Conservation (TAC/ALC):

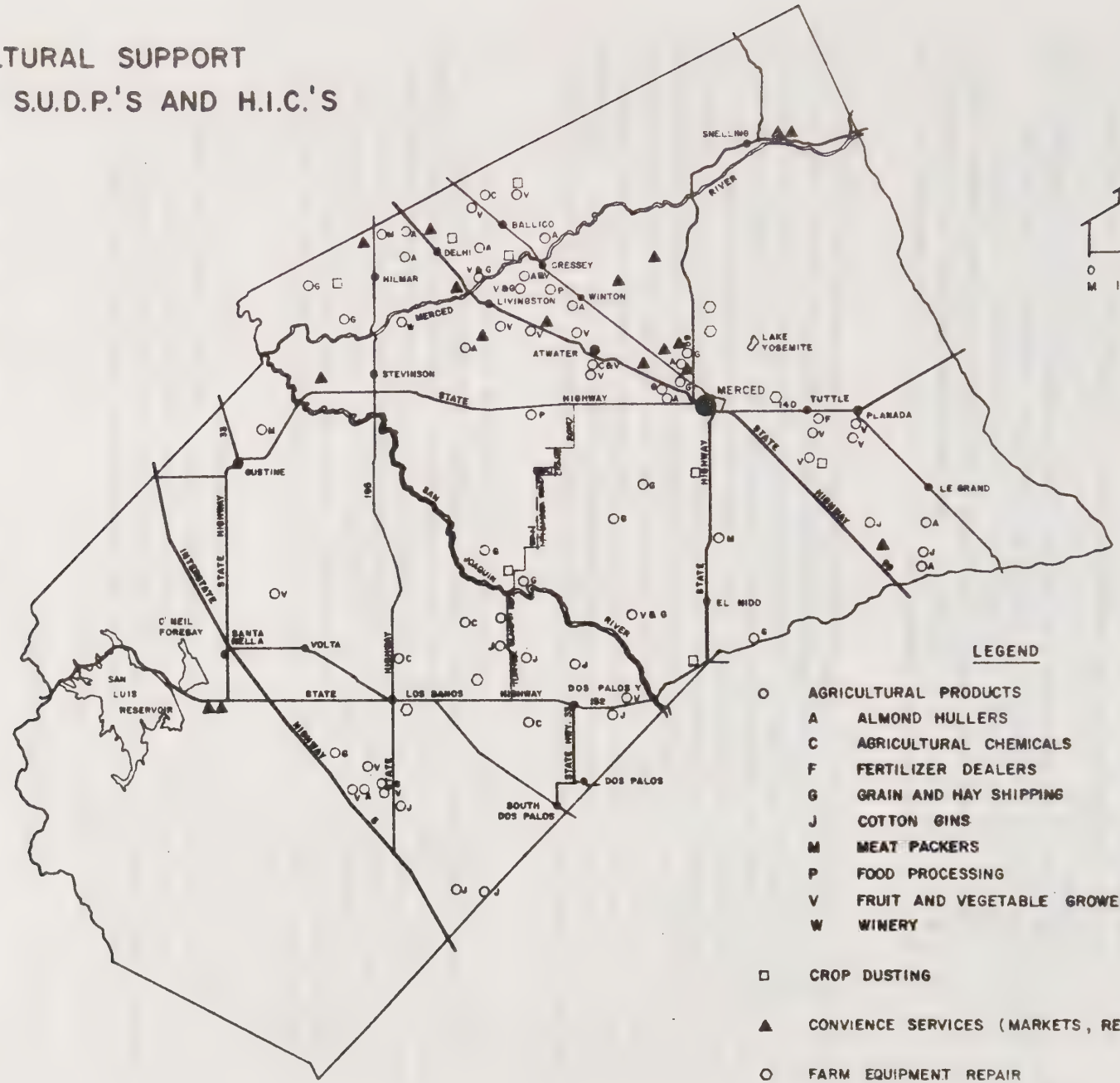
A. Permitted Uses:

1. Housing

B. Conditional Uses (must obtain permit before operating):

1. Veterinary services
2. Farm equipment and machinery sales, storage, rental, and repair
3. Welding in conjunction with Item 2
4. Agricultural employment services
5. Feed and farm supply stores
6. Fertilizer and agricultural chemical sales
7. Farm labor housing
8. Grocery stores
9. Gas stations and garages (excluding body shops)
10. General stores serving weekly needs of surrounding farm community

TYPES OF AGRICULTURAL SUPPORT SERVICES OUTSIDE S.U.D.P.'S AND H.I.C.'S



LEGEND

- O AGRICULTURAL PRODUCTS
  - A ALMOND HULLERS
  - C AGRICULTURAL CHEMICALS
  - F FERTILIZER DEALERS
  - G GRAIN AND HAY SHIPPING
  - J COTTON GINS
  - M MEAT PACKERS
  - P FOOD PROCESSING
  - V FRUIT AND VEGETABLE GROWERS AND SHIPPERS
  - W WINERY
- □ CROP DUSTING
- ▲ CONVIENCE SERVICES (MARKETS, RESTAURANTS, BARS, GAS)
- O FARM EQUIPMENT REPAIR

FIGURE 4

11. Liquified petroleum gas distribution
12. Cafes and cafeterias (may serve beer and wine only)
13. Beauty and barber shops
14. Trucking operations involved in agriculture
15. Churches
16. Schools permitted as an existing use; no creation of new schools allowed

Housing density will be one unit per acre. The zoning policy for the ASC will state that residential subdivisions will be provided primarily for those employed or owning land within the ASC and its surroundings. It shall not serve as a rural residential center for people who work in other communities. An ASC will also not serve as a floating zone to allow further development near scattered agricultural or commercial services like those mapped in Figure 4.

Along with the concept that some SUDPs may better serve as ASCs is the potential need for additional agricultural support areas to serve portions of the county presently outside a convenient travel distance. Figure 5 displays those areas outside a seven mile radius from existing SUDPs. Also shown is the distribution of population in these areas as a means to determine the level of demand for new services. In all areas mapped, the population level is insufficient to support new commercial centers. Except for the conversion of existing smaller SUDPs into ASCs, there does not appear to be a need for creating a new ASC in other county areas. The great majority of the county's farms can be served from the existing commercial centers and SUDPs. Scattered new ASCs should not be created that would lead to conversion of agricultural land.

A somewhat different type of center for the location of agricultural industries in the county are PAID zones (Planned Agricultural Industrial Developments). The concept behind this zone is to provide a location (minimum area of 160 acres) for agriculture-related industrial and support operations which create negative impacts on neighboring properties. These types of operations (animal sales yards and meat packing for example) often produce large amounts of solid waste, wastewater, odors and dust which make them inappropriate uses for SUDPs. Figure 6 shows possible locations where PAID zones can be created.

A PAID is distinct from an ASC in several respects. A PAID zone must be located on poor quality soils at least two miles, but not more than seven miles, from a major SUDP. In addition, while an ASC should provide convenience commercial services to the rural population in the region, a PAID zone would only allow such services as an accessory use for the local employees (for example, a cafeteria).

TRANSPORT OF AGRICULTURAL PRODUCTS

The shipment of agricultural products within the county relies on five state highways, many secondary collectors, and Interstate 5 to a limited extent. The major east-west links are Highways 140 and 152, and the primary north-south routes are Highway 59, 165, and 99. During the summer harvest months these roads are very heavily traveled by agricultural trucks and are inefficient routes for much of the agricultural sector - especially between Livingston and Atwater in the north and the Dos Palos area to the south. The present collector road network between these areas is indirect and eventually feeds onto either Highway 59 or 165 adding to congestion.

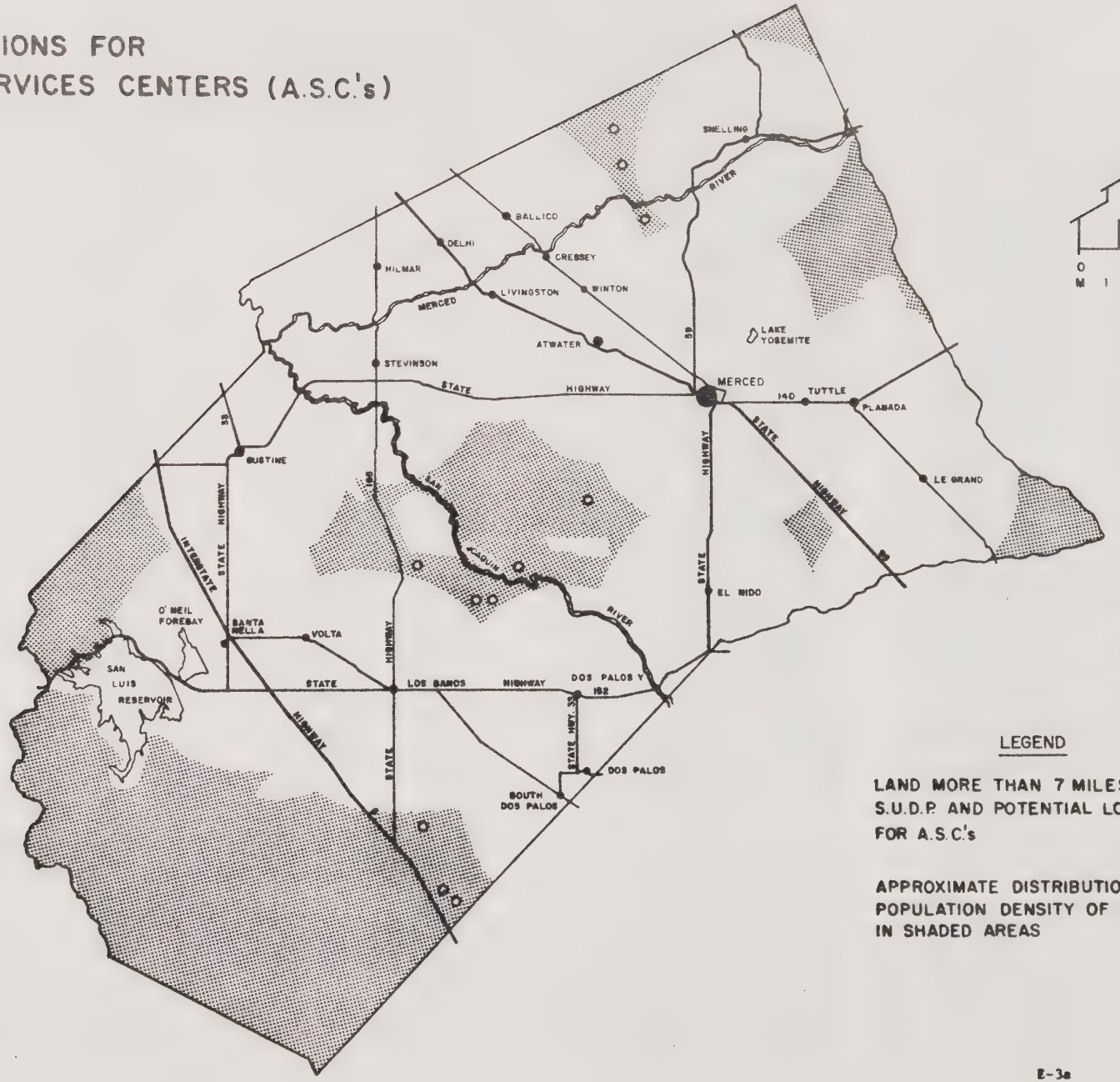
There is a need for a new north-south link located between Highway 59 and 165 connecting the communities northwest of Merced to the Dos Palos area. Or an alternative could be improvement of Turner Island - Dan McNamara - Bert Crane Roads (shown in Figure 4). At the very least, State Highways 165, 140, and 59 need to be improved or widened to support more traffic and improve safety.

Although no studies have been completed as part of this element, it is the feeling of the TAC/ALC that the county should research the possibility of a new road location and identify possible sources of funding. The county should also encourage the State to improve or widen existing State Highways 59, 140, and 165. These projects would be a substantial benefit to the movement of agricultural products in the county.

CONCLUSION

By redesignating some smaller SUDPs as Agricultural Services Centers and through creation of new PAID zones, the agricultural community of Merced County can be enhanced. Necessary services for the rural farm population would be provided and the industries necessary to process and distribute agricultural products will have central locations where the impacts can be minimized avoiding potential urban/agricultural impact problems. These efforts will reduce the threat of farmland conversion posed by urbanization of agriculture-related centers.

POTENTIAL LOCATIONS FOR AGRICULTURAL SERVICES CENTERS (A.S.C.'s)



LEGEND

LAND MORE THAN 7 MILES FROM AN S.U.D.P. AND POTENTIAL LOCATIONS FOR A.S.C.'s

APPROXIMATE DISTRIBUTION OF POPULATION DENSITY OF 50 PEOPLE IN SHADED AREAS

FIGURE 5

POTENTIAL PLANNED AGRICULTURAL INDUSTRIAL DEVELOPMENT ZONES

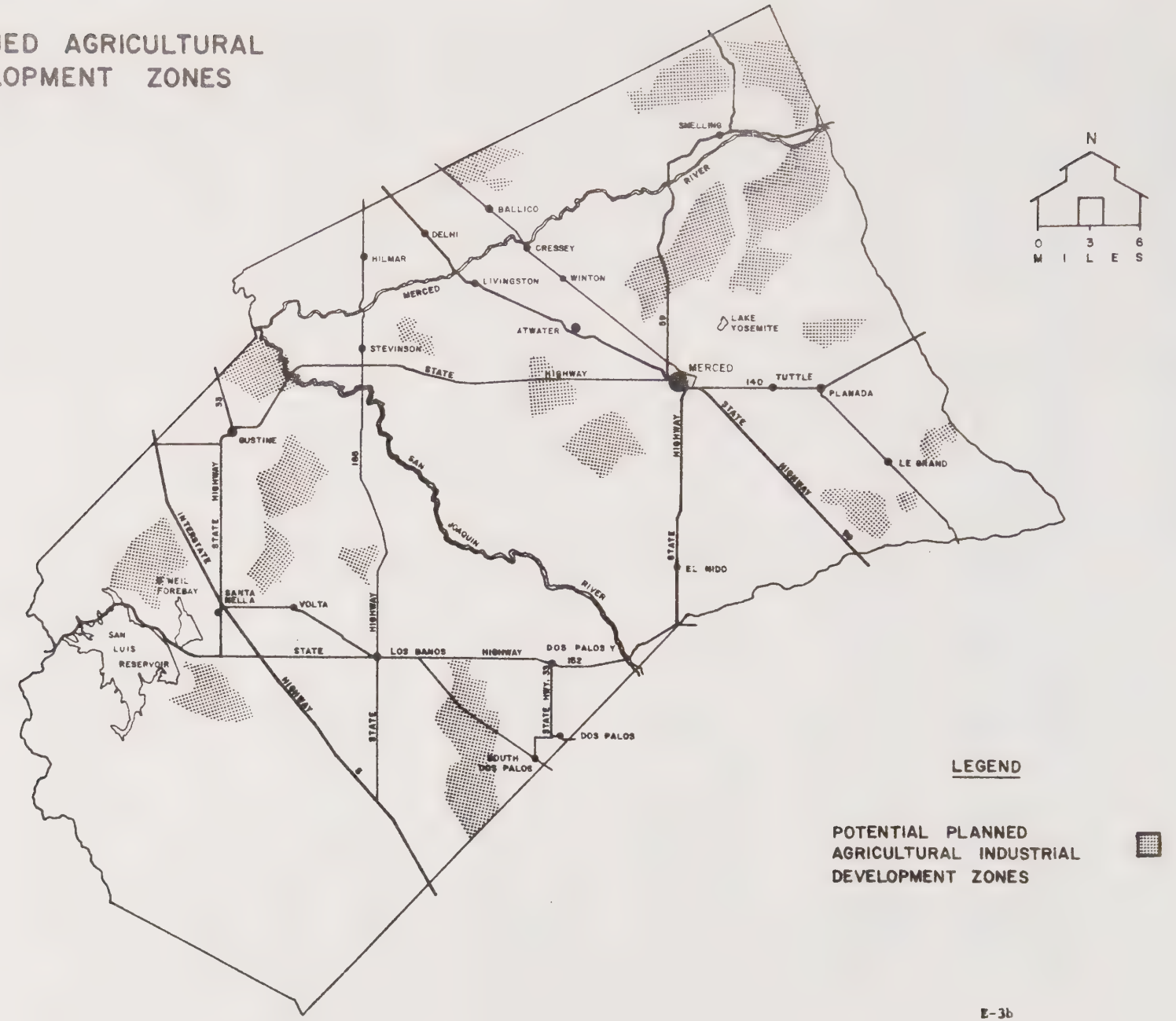


FIGURE 6

F. IRRIGATION, FLOODING, AND DRAINAGE

WATER AVAILABILITY

The San Joaquin Valley is the southern half of California's Great Central Valley. Its 8.5 million acres lie between the Sierra Nevada, the Coast Range, the Tehachapi Mountains, and the Delta of the Sacramento-San Joaquin Rivers. About 4.5 million acres (7,030 square miles) of this land is devoted to irrigated agriculture. According to the 1982 Census of Agriculture, there were 450,559 acres of irrigated farmland in Merced County.

GROUNDWATER: In the San Joaquin Valley, irrigated agriculture is heavily dependent upon groundwater. According to the Department of Water Resources, about 55% of the agricultural applied water demand is met from groundwater withdrawals. Nearly two-thirds of all groundwater withdrawals for the State of California occur in the Central Valley.

The San Joaquin Valley is separated into two hydrologic basins by an indistinct divide which interrupts the lengthwise slope of the Valley. The San Joaquin Subbasin to the north (including Merced County), which drains to the Pacific Ocean; and the Tulare Subbasin to the south, which has an outlet only when rare floodflows carry its water across the divide and into the San Joaquin Subbasin.

Groundwater has become an ever important water supply in the San Joaquin Valley Basin. The heavy reliance of agriculture on groundwater is evidenced by the annual overdraft in both Subbasins of 1.56 million acre feet, 84% of which occurs in the southerly Tulare Subbasin. The groundwater withdrawals in the Valley are mostly by individuals, withdrawals by water agencies represent less than 10% of total withdrawals.

In response to the Valley's increasing demand for water, the Federal government's Central Valley Project (CVP) began delivering water to the Valley in the 1940's, and California's State Water Project (SWP) followed with additional imports in the late 1960's. With this additional water, groundwater level declines slowed or even reversed in areas receiving imported water.

Groundwater overdraft in the Valley has decreased from 2.5 million acre feet per year in 1957, to 1.5 million acre feet per year in 1979, largely because of deliveries of imported water from the SWP and the CVP.

Most water districts in Merced County rely on groundwater for only a limited portion of their supplies. Only the areas around El Nido and Le Grand have overdraft problems at present. Groundwater recharge efforts near El Nido consists of diverting winter runoff water into sand fields and pastures. Recharge in most other areas of the county takes place through percolation of surface water in streambeds and unlined canals.

SURFACE WATER IRRIGATION: Water companies and districts have been providing Merced County farms with irrigation water for over 100 years. Today the County is served by 25 water and irrigation districts, (and several small private systems), irrigating more than 456,000 acres. The districts vary in size from the Merced Irrigation District (MID) with more than 154,000 acres serving most of the east side; to the Eagle Field Water District serving just

1,400 acres in the Dos Palos area. Water sources of the districts include the CVP and the SWP, the Merced River, groundwater pumping, recirculation of drainage water, and for some of the smaller districts, water purchases from MID and the other larger districts.

Excepting the foothills and areas of the San Joaquin River floodplain, nearly all of Merced County is within the boundaries of an irrigation or water district. The County's extensive canal system had done much to promote and contribute to Merced's abundant and highly diverse agricultural industry. Figure 7 illustrates the County's major irrigation system. The present canal system can be divided into three major geographic areas: 1) Westside: the area west of the San Joaquin River has the California Aqueduct, Delta-Mendota Canal, and the San Luis Canal, forming the basis of the westside canal system. These major canals have several smaller laterals diverting water to the large westside farms. 2) Merced River area: several districts, including MID, divert water from the Merced River as it flows through the northern area of the county. Some water is also supplied by the Turlock Irrigation District from the Tuolumne River which serves the Delhi, Ballico, and Hilmar areas. This includes some of the most intensively cultivated land in the county. Parcel sizes are generally smaller than other areas of the county and there are more canals to serve these farms. 3) The southeastern area: the Planada, Le Grand, and El Nido areas of the county are supplied by connections to the MID and through groundwater pumping. There are several streams flowing through the area which drain into the San Joaquin River. This area is experiencing a shortage of water in the summer irrigation period because of the limit in canal and pipe capacity from the MID. Any improvement to the system or installation of another water source would be expensive for the local farmers.

IRRIGATION PROBLEMS: Three of the most pressing irrigation problems facing San Joaquin Valley farmers are: saline-sodic soils, groundwater quality and on-farm irrigation efficiency.

1) Soluble salts and soil boron concentrations are the result of natural saline-sodic soils and irrigation water high in salts. Figure 8 shows areas with saline-sodic soils totaling 393,860 acres in the county. Where there is a high water table, high salt concentrations adversely affect crop production. Leaching with excess water is an effective improvement measure, but only where the subsurface layers allow percolation. Tiling to remove subsurface water can also improve the soil.

2) Low quality groundwater is found throughout much of the San Joaquin Valley Basin. The quality of groundwater is determined primarily by salt concentrations, but also includes problems from concentrations of nutrients, pesticides (like DBCP), and other contaminants. High levels of soil boron (a naturally occuring salt) and total dissolved solids are concentrated west of the San Joaquin River. Groundwater quality is similar to surface water quality in Merced - it is good in the higher valley areas and decreases in quality toward the valley trough.

Groundwater quality is an important factor in crop selection and production as many crops are sensitive to high concentrations of salt. Figure 9 illustrates areas within the county experiencing water quality problems. Additional groundwater quality problems especially found in shallow wells northwest of

Atwater are concentrations of nitrates and DBCP. Poor groundwater quality affects 299,995 acres in Merced County.

Where high groundwater salt concentrations exist, the mixing of surface and groundwater supplies, the use of calcium amendments, and the choice of crops adapted to these conditions can relieve most of the problem.

3) Low on-farm irrigation efficiences mean more water is being applied than plant growth requires. In cases where salt concentrations are high, more water must be applied than the plant uses to allow for leaching. Significant areas have low on-farm efficiencies (below 60%), totaling about 209,450 acres in Merced County as shown in Figure 10. However, overall San Joaquin Valley irrigation efficiency is higher, amounting to about 73% for the San Joaquin Subbasin because of the reuse of return flows downstream.

FLOODING

EXISTING CONDITIONS: Flooding is a natural occurance in the Central Valley. The Valley is a natural drainage basin for thousands of acres of foothill and mountain land of the Sierras. Approximately 750,000 acres in the San Joaquin Subbasin are prone to flooding. In Merced County, the Flood Plains of the San Joaquin and Merced Rivers, and their tributaries encompass nearly one half of the Valley floor. Figure 11 illustrates the areas of Merced County subject to 100 year frequency floods, including roughly 380,010 acres of land.

Early floods were mainly interruptions to travel. In the San Joaquin Valley, land routes of travel were established near the eastern foothills, in part, to keep above the overflow lands in the Valley trough. As the Valley developed and cities and towns grew, flooding impacts became more of an urban problem not merely impacting agricultural uses.

Merced County and the Central Valley experience two types of floods: 1) general rainfall floods occur in the late fall and winter in the foothills and on the valley floor, and 2) snowmelt floods occur in the late spring and early summer. Most floods in Merced County are produced by extended periods of rainfall during the winter months.

Many of the flood problems are due to poor flood plain use, resulting in costly damages to public and private property. Conversions of agricultural land to more intensive uses such as rangeland to cropland where land leveling or irrigation facilities may be required promote drainage problems. Agricultural activities such as land leveling, irrigation facilities, removal of natural ground cover, and alternation of natural contours all have drainage impacts that may aggravate downstream flooding.

HIGH WATER TABLE: Additional flood problems, as well as agricultural production problems, are caused by high water tables. This is a condition where dense layers of heavy clay soils block downward percolation of applied water into the substrata. Figure 12 displays areas with a water table within 5, 10, and 20 feet of the ground surface. In the "Grasslands" area west of the San Joaquin River, these areas are primarily duck clubs and wetlands. To the south and east of Merced, the lands are used for irrigated pasture, or for more intensive crop production where drainage practices are utilized to lower the water table.

FLOOD DAMAGES: Historical damages have primarily been to agriculture and have occurred during periods of relatively low flooding. The flood of spring and summer of 1969 was responsible for damages totaling (in 1975 prices) $36.6 million for the San Joaquin Subbasin; of which nearly $26.6 million were damages to agriculture. Agricultural damages from flooding average $1.1 million annually in the San Joaquin Subbasin.

The City of Merced has had a long history of flooding. Newspaper articles, accounts from local residents, and recent official records indicate that flooding occurred in 1935, 1936, 1937, 1938, 1955, 1958, 1969, and 1973. The largest floods of recent record occurred in December 1955, February 1958, January-February 1969 and in the winter of 1982-83 (which caused about $3.75 million in damage to agriculture). Earlier flood damages to the County by major classification have been updated for 1979 price levels and are shown in the following table.

HISTORIC FLOOD DAMAGES
(1979 Prices)

Damage Classification	1955	1958	1969
Residential	224,000	0	1,000
Commercial	52,000	143,000	0
Industrial	73,000	4,000	3,000
Public Facilities	527,000	9,000	134,000
Agricultural	604,000	841,000	1,717,000
Total Damage	$1,480,000	$997,000	$1,855,000
Total Acres Flooded	15,300	19,800	24,030

WILDLIFE IMPACTS: Extensive flood control improvements have been undertaken in Merced County and adjacent counties, that have greatly reduced the flood prone areas, and in doing so, reduced natural open space utilized as wildlife habitat and passive recreational space.

The San Joaquin Valley Basin is a major waterfowl wintering area. Between 1965 and 1975, one-fourth of the waterfowl in the State was found in the Basin. In the San Joaquin Subbasin, there are five major wetland management areas. The "Grasslands" area on the westside of Merced County, provides 92,320 acres of waterfowl habitat during part or all of the year.

Much of the upland game habitat has been modified by intensive agricultural cultivation and double cropping, limiting the value of agricultural land as habitat.

EROSION: This problem occurs on irrigated sloping lands, grasslands on the coastal range, and along streambanks. Tolerable erosion levels are between four and five tons per acre per year. The areas displayed in Figure 13 are more severe. Sedimentation carried downstream impacts additional acres of farmland where crops are often buried after heavy rains.

Erosion caused by farming on sloping land can be reduced by many techniques, including: drip irrigation systems, planting a cover crop, contour farming

MAJOR IRRIGATION CANALS, LATERALS AND CREEKS

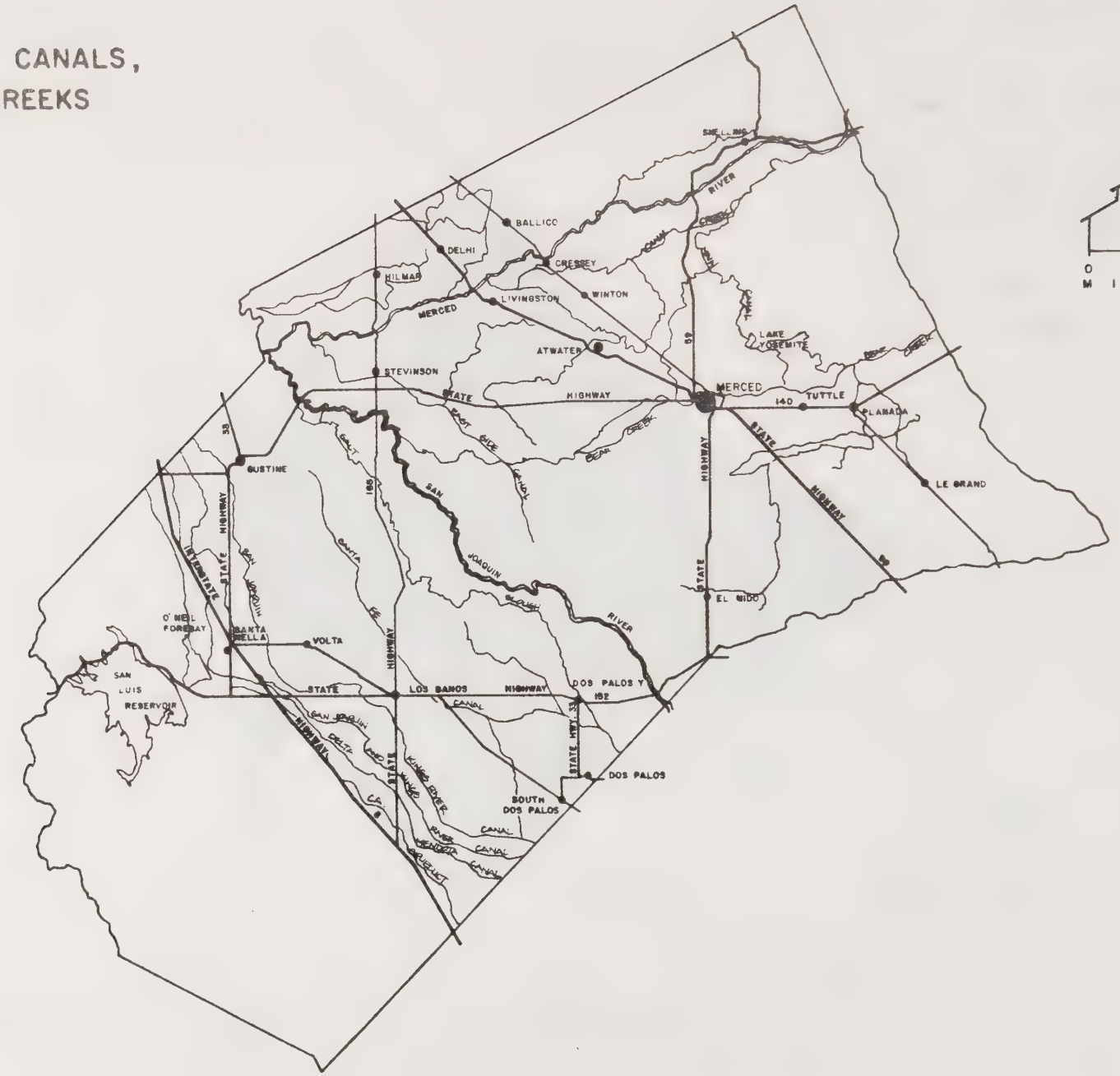
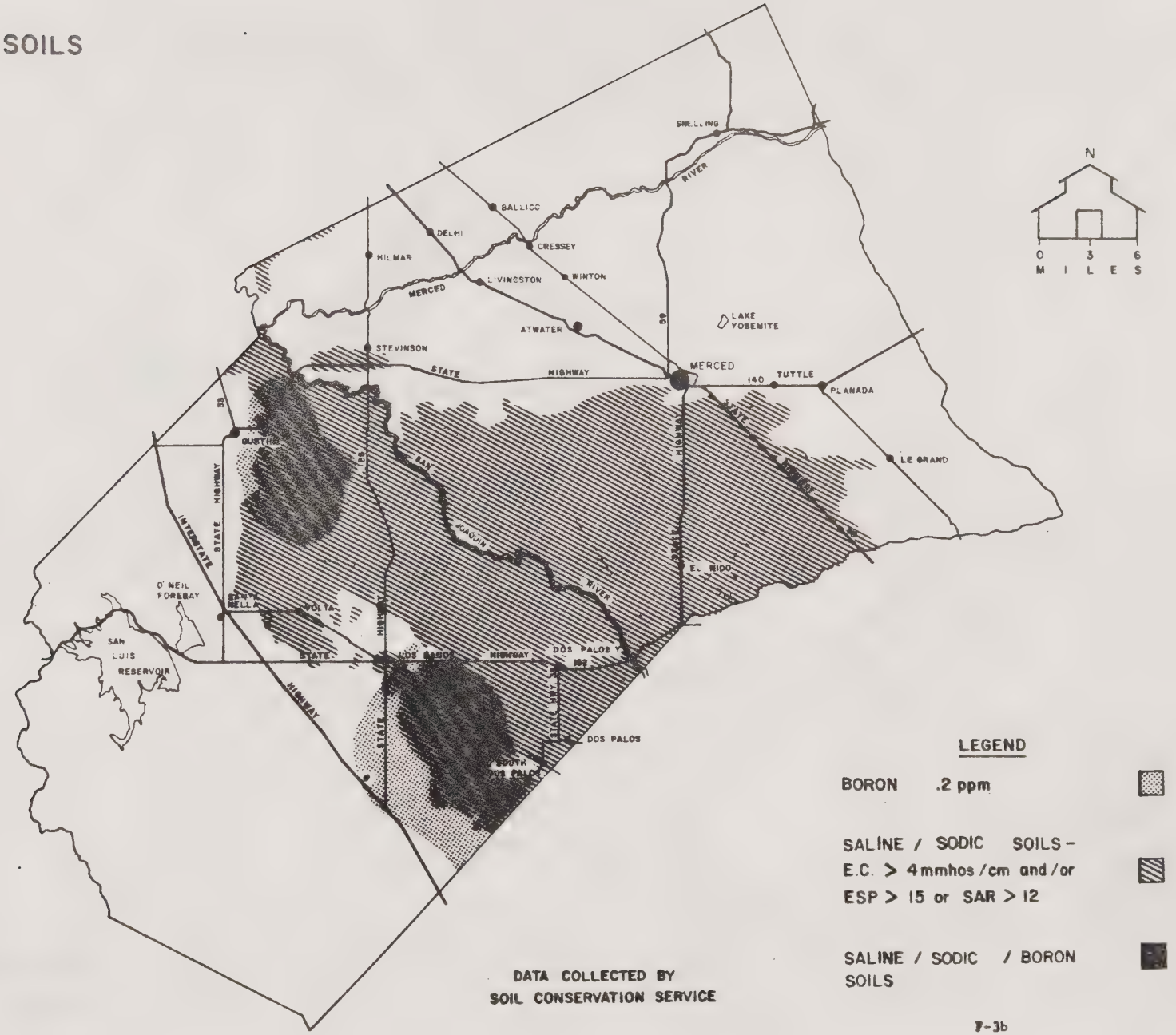


FIGURE 7

SALINE / SODIC SOILS



LEGEND

BORON .2 ppm

SALINE / SODIC SOILS – E.C. > 4 mmhos/cm and/or ESP > 15 or SAR > 12

SALINE / SODIC / BORON SOILS

DATA COLLECTED BY SOIL CONSERVATION SERVICE

FIGURE 8

WATER QUALITY

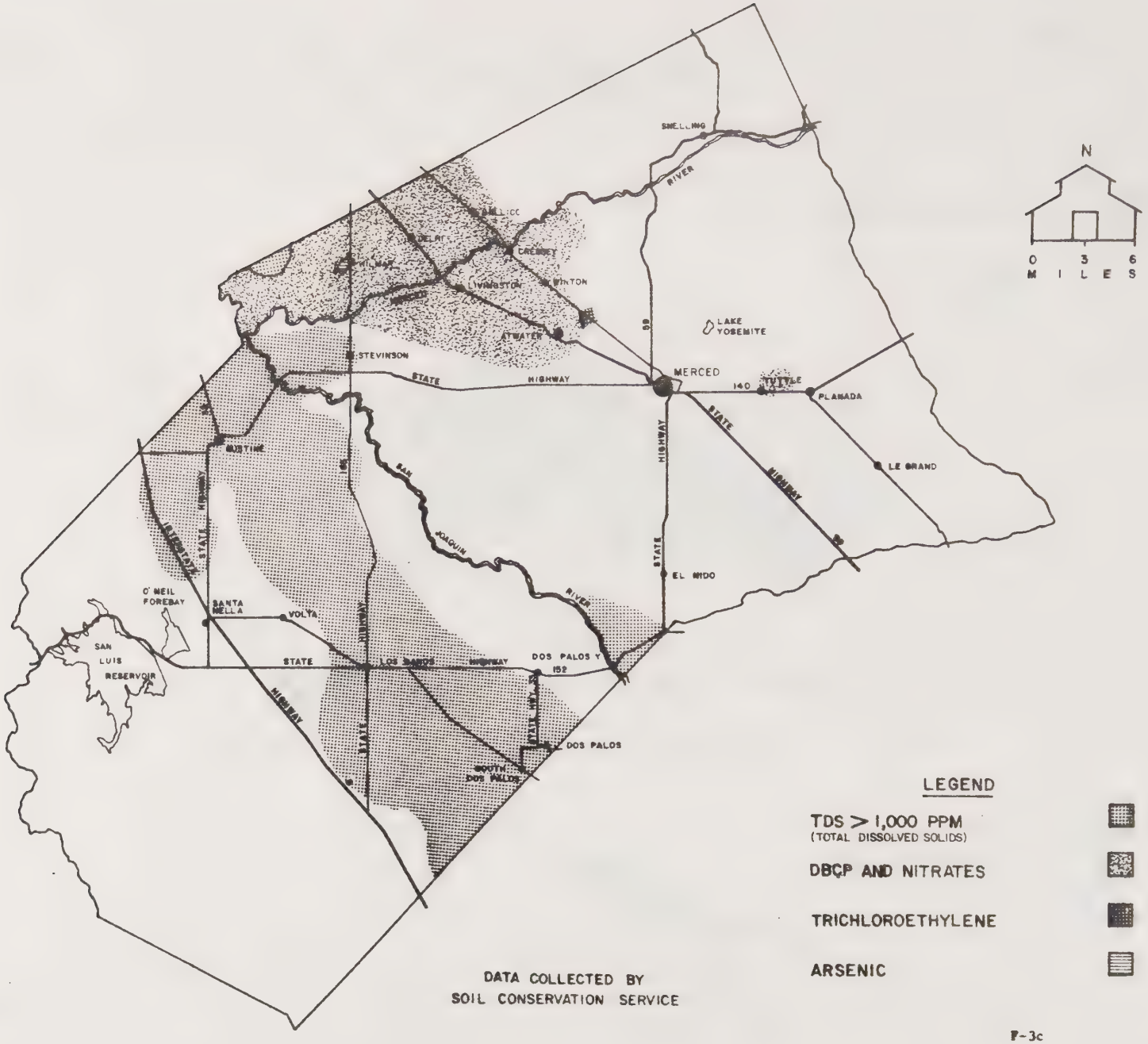
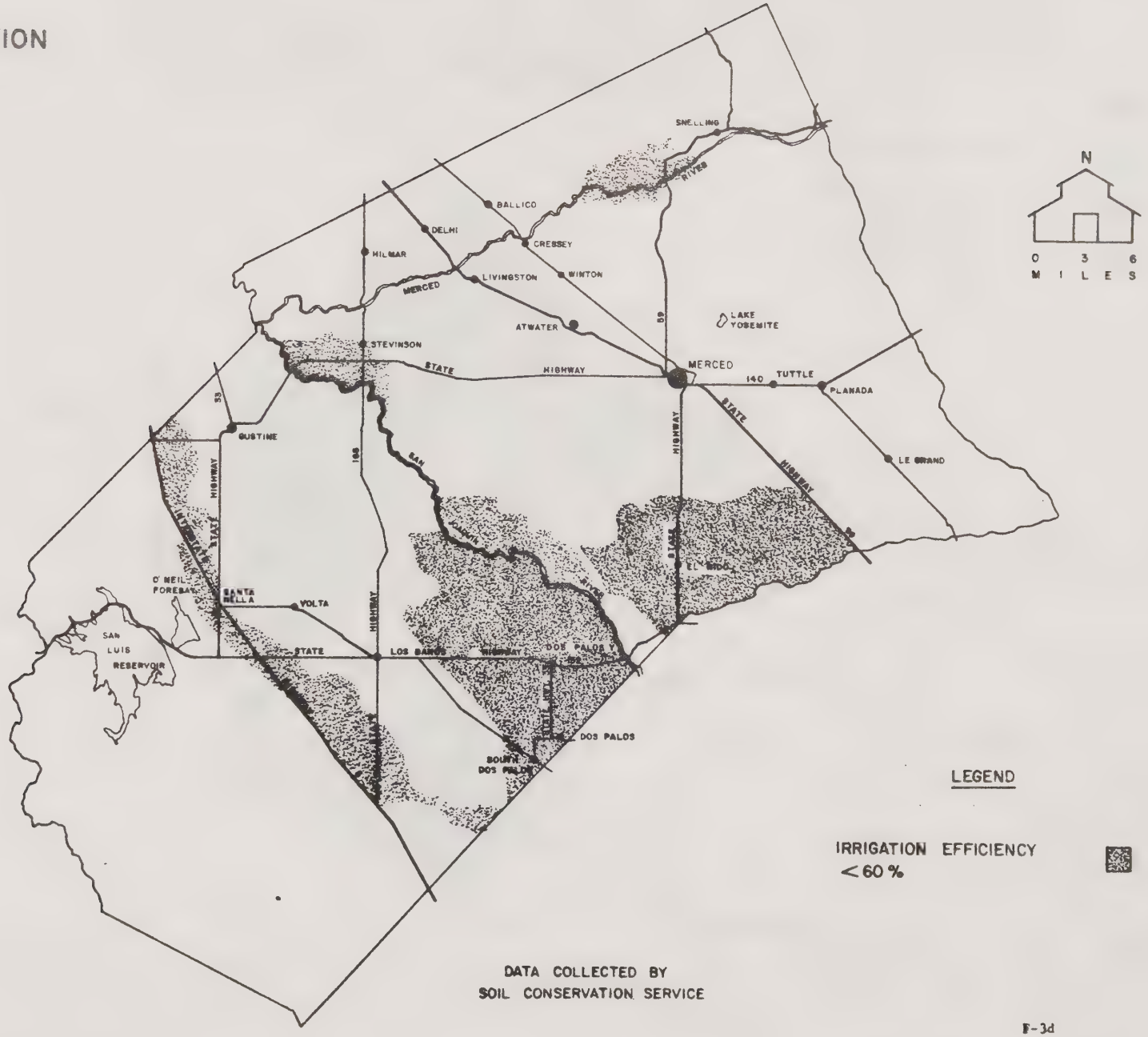


FIGURE 9

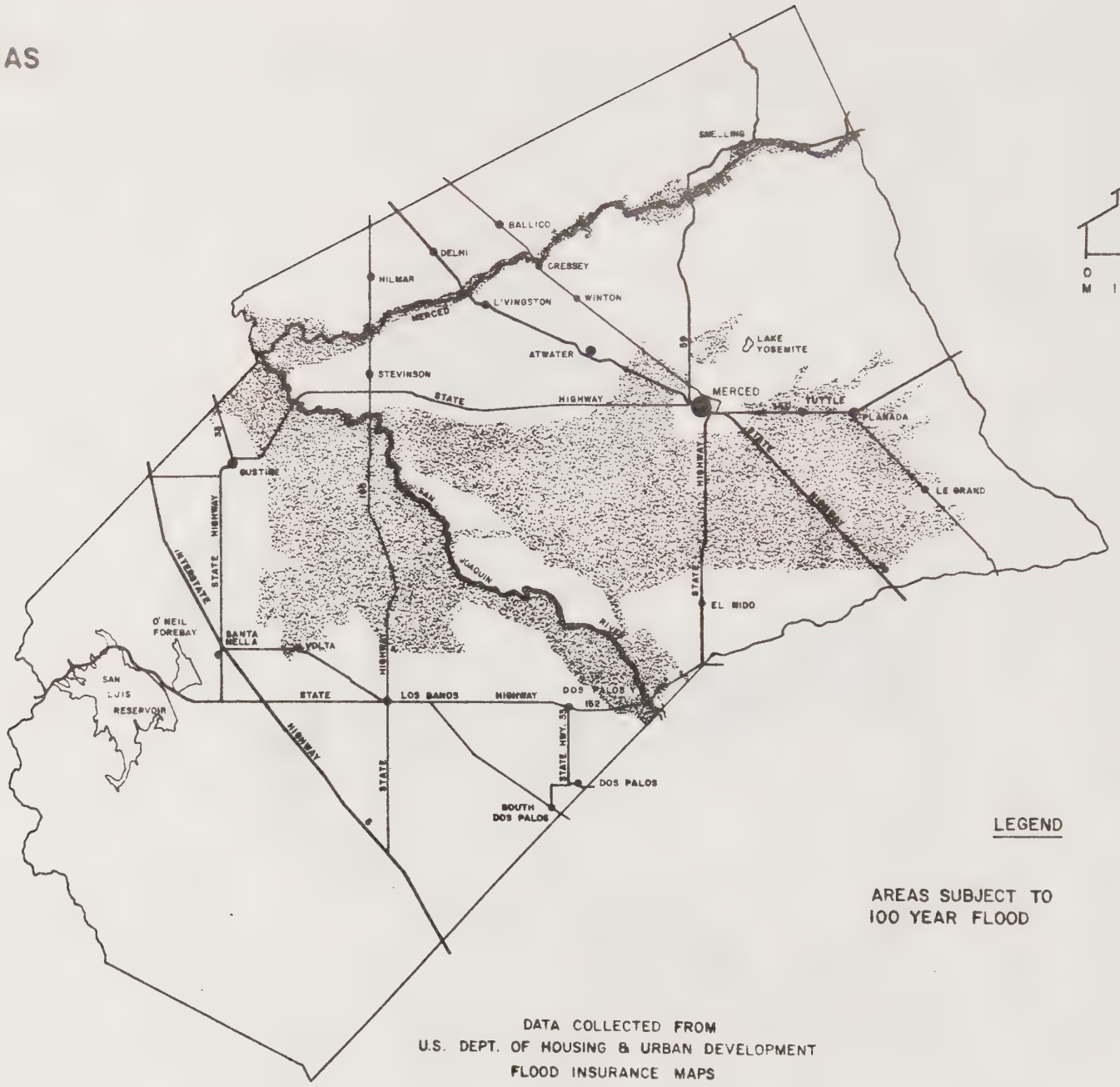
WATER CONSERVATION



DATA COLLECTED BY
SOIL CONSERVATION SERVICE

FIGURE 10

FLOOD PRONE AREAS



DATA COLLECTED FROM
U.S. DEPT. OF HOUSING & URBAN DEVELOPMENT
FLOOD INSURANCE MAPS

FIGURE 11

HIGH WATER TABLE

DATA COLLECTED BY
SOIL CONSERVATION SERVICE

FIGURE 12

practices, minimum tillage, and catch basins. The Soil Conservation Service (SCS), Agricultural Stabilization and Conservation Service (ASCS) and local Resource Conservation Districts (RCDs) all encourage farmers to utilize erosion measures, but are often resisted because of the high cost of many measures. Several attempts are being made to require erosion mitigation measures for farms participating in federal programs. The ASCS is attempting to link federal water distribution to erosion practices on individual farms. And a federal bill approved by the Senate in November, 1983, would deny commodity price supports for a specific commodity grown on highly erodible land.

WATER POLICIES: Irrigation and flood control projects are governed by many agencies of the federal, state, and local governments. Water and irrigation districts serving the Merced County farms are also controlled through one or more of the various governmental agencies. The CVP is a federal project that made farming possible for many thousands of acres in the Central Valley by supplying low cost irrigation water. The SWP has also acted to promote highly intensive farming in the Valley where climatic conditions previously prohibited such development.

The Army Corps of Engineers has studied water systems throughout the country and in particular in the West has built extensive flood control and hydroelectric projects. Further flood control efforts are planned in the "Merced County Streams Group Project" for the east side of the county which consists of: two new detention dams (Castle on Canal Creek and Haystack Mountain on Black Rascal Creek); enlargement and modification of the Bear Creek detention dam; construction and modification of 32 miles of levees and channels on the Bear Creek Stream Group (Fahrens, Black Rascal, Cottonwood and Bear Creeks; Black Rascal Slough, and El Capitan Canal); a protective easement on 2,800 acres of marsh and grasslands; and a few environmental and recreation projects. The plan would provide standard project flood protection to most of urban Merced, and about 25-year flood protection to agricultural areas downstream of the city. The project cost estimate is $111 million dollars. The Federal government is presently debating cost-sharing requirements: Administration's proposal is for the non-federal share to be 35 percent of total project costs. The project has been authorized by Congress, but funding has not been allocated.

This plan has been scaled back from earlier Army Corps of Engineer proposals which also included flood protection projects on Deadman, Duck, Owens, and Mariposa Creeks and modification to Burns Creek Dam. These projects were left out because they did not provide an adequate economic benefit ratio.

In an effort to implement flood control projects on a coordinated local level, the "Merced County Critical Area Flooding and Drainage Plan" was prepared in 1983. This plan describes design of collection systems to serve present and projected urban land uses, providing detention basins to control drainage flows, and a drainage network using MID irrigation canals and natural channels. Flooding in rural agricultural areas were not a part of the study. The plan calls for creation of a Merced County Flood Control District which will maintain natural channels and improve their drainage capacity so that no increase in potential flooding would occur downstream.

Existing county flood plain policies include Ordinance No. 899, the "Flood Damage Protection Ordinance." This ordinance provides for the control and regulation of land use and structures within the various water sheds and their flood plain areas. In Merced County, only agricultural and open space uses are permitted in the Primary Flood Plain Area as designated on the Federal Flood Insurance Rate Maps. The county is presently working with the Federal Government to resolve several inaccuracies in this map.

The Safety, Conservation, and Open Space Elements to the County General Plan address the various issues of flood control, drainage, wildlife habitat, and land use in the flood prone areas. Descriptions of the various water resources and associated habitats are described and policies and recommendations are established. These elements form the basis for county land use policies in these sensitive environments for public safety and resource protection.

DRAINAGE

EXISTING CONDITIONS: The lack of sufficient drainage on agricultural land severely limits the productivity of thousands of acres in Merced County. In areas with high water tables, salt-laden water accumulates in the soil and steadily rises as irrigation and leaching continue. Improper drainage will usually have the following characteristics: 1) leaching is relatively ineffective because the salts cannot percolate into the substrata, 2) capillary action draws salty water upward from the high "perched" water table where the soil becomes further saline when the water evaporates, and 3) high groundwater deprives crop roots of oxygen.

This problem is evident on a more regional level. The final report of the San Joaquin Valley Interagency Drainage Program (1979) points out that high, brackish water tables underlay about 400,000 acres in the San Joaquin Valley at present, and could eventually affect up to one million acres as areas with saline water tables spread and seep into adjacent water sheds.

In the west side of the county near Gustine, drainage is currently recirculated for irrigation or discharged into the San Joaquin River. In the west side areas to the south, drainage is also recirculated for irrigation, or it is discharged through drainage ditches to marsh lands of the Grasslands Water District. After the duck hunting season, the waters are drained into the Salt and Mud Sloughs which are tributaries of the San Joaquin River. An additional 5-8,000 acres of farmland from the Westlands Water District in Fresno County drains into the partially completed San Luis Drain, which emptys into the Kesterson Reservoir. In the eastside of the county, drainage waters are placed in natural streams and waterways, and into irrigation canals. Water not later used for irrigation ends up in the San Joaquin River.

Agricultural drainage programs are presently implemented on a local level. The RCDs and irrigation and water districts all assist in developing master drainage plans for their districts. The main objective is transporting drainage and flood water out of their area of jurisdiction to improve the productivity and safety of the local farms. Regional problems often stretch the administrative capabilities of these agencies.

EROSION

DATA COLLECTED BY
SOIL COINSERVATION SERVICE

F-5a

FIGURE

An example of problems resulting from the lack of regional, state, or federal coordination is the increasing salinity of the San Joaquin River. Several irrigation districts have purchased supplemental water from the CVP to mix with and improve the quality of the river water. And the lack of proper regional drainage affects areas where highly saline water enters the water table resulting in reduced farm yields or productivity.

DRAINAGE POLICIES: Two positive steps are being undertaken at the present time. An experimental desalinization plant in Los Banos operated as part of the State Water Project is researching the technology and costs of improving irrigation water quality, and thus, reducing the salt content of water entering major drainage systems.

A second effort, now in the planning and design stage, is a project to dredge out more than 200 miles of the silt-laden San Joaquin River. This is a combined effort of the U.S. Army Corps of Engineers and the San Joaquin River Flood Control Association, made up of local farm water groups. This project will both improve drainage capacity and help reduce flooding like that which occurred in the winter of 1982-83 around Stevinson. Local involvement is required for coordination of flows into the river from various reservoirs, and local districts will be responsible to maintain their portion of the river once dredging is complete.

Perhaps the most comprehensive proposal to improve Merced County drainage and water quality problems is the completion of the San Luis Drain. At present test capacities, this is an 82 mile concrete lined channel collecting drainage from 5-8,000 acres in western Fresno County, and depositing it into evaporation ponds at the Kesterson Reservoir near Gustine. The planned project at completion calls for a 188 mile system starting in Kings County and draining into the Delta at Chipps Island in Contra Costa County.

A serious problem has developed at Kesterson as a result of the Westlands drainage water. High concentrations of various trace elements including selenium - a naturally occurring element in the soil which is harmless in small quantities, but can be lethal at higher doses - are being leached out of the Westlands soil. Selenium has been blamed for causing severe deformities in waterfowl and loss of other wildlife at the Reservoir. On October 1, 1984, Kesterson was included among 340 sites across the nation that the Federal Government identified as having toxic waste contamination.

Various impacts from the contamination at Kesterson are possible. Besides causing death and deformity in waterfowl, the selenium may concentrate in the meat and liver of ducks which are eaten by humans. The State Department of Food and Agriculture in cooperation with the Bureau of Reclamation has undertaken a study of crops in the western San Joaquin Valley to assist in their determination of the impact of selenium and other trace elements in the San Luis Unit of the Central Valley Project. Another problem is that in 1982, 4,000 acre feet of drainage water at Kesterson was lost through seepage into the ground while only 2,000 acre feet evaporated. In a study released by the U.S. Geological Survey on November 20, 1984, high concentrations of selenium, mercury, and chromium were found in shallow groundwater samples at various locations between Kettleman City and Los Banos, with the highest concentrations found in the Panoche Fan area near Firebaugh.

A long-term solution to the drainage problem must be found or tens of thousands of acres of farmland in Western Merced County with poor drainage may be lost to agriculture. The continued flow of waters from outside the county into Kesterson has the potential to impact even more of the county's farmland through contamination of crops, livestock, and wells.

G. FINDINGS AND ELEMENT GOALS, OBJECTIVES, POLICIES, AND IMPLEMENTATION

FINDINGS - Agricultural Economy

The county economy is heavily dependent upon the agricultural sector. With the recent losses in farm income due to bad weather and depressed prices, the value of crop production has declined from $321 million in 1980 to only $247.7 million in 1982 when adjusted for inflation (using 1967 dollar values). And when the "multiplier effect" of added economic activity and employment in agricultural support and other industries is considered, this loss is even more significant to the county.

Rising costs of land, water, energy, labor, and interest on debt as well as taxes, have been major factors in the reduction in agricultural profitability in recent years. Support and cooperation from all levels of government is vital to the improvement of these conditions. The enactment of measures by the county to assist the agricultural sector will result in benefits to both the farmers and the county as a whole.

GOAL 1. Seek to improve the financial viability of the agriculture sector.

Objective 1.A. Promote agricultural operations and businesses that provide a competitive edge to Merced County farmers.

Policy 1. Support the introduction of new agricultural processors in the County SUDPs and PAID zones through consideration of suitable financial mechanisms such as Industrial Revenue Bonds.

Implementation: The Board will initiate a program to provide financial incentives to new agricultural industries locating within an SUDP or PAID zone. The County will devise this program as part of the Economic Development Plan/Program.

Policy 2. Seek programs and measures to encourage new agricultural industries in Merced County.

Implementation: The Board will encourage the County Chamber of Commerce to promote Merced as a profitable location for agricultural processing and related industry.

Objective 1.B. Provide input on State and Federal legislation which impacts Merced County agriculture.

Policy 3. Communicate the County's interests to State and Federal legislative bodies when major legislation is proposed which impacts Merced's agricultural sector.

Implementation: The Board requests the Farm Bureau and other agricultural interest groups to keep it apprised of pending major legislation which would significantly impact farming in Merced County so that the Board may take a position on such legislation.

Objective 1.C. Consider programs which reduce the tax burden on farmland and aid in the conservation of agricultural lands if investigation indicates such programs benefit the general welfare of the county.

Policy 4. Undertake a study to determine the economic feasibility of offering Williamson Act contracts in the county.

Implementation: The County Administrator will conduct a study of the economic feasibility of the Williamson Act through coordination with the County Counsel, Agricultural Commissioner, Assessor, Auditor, Planning Department, the Merced County Farm Bureau, the County Chamber of Commerce, and California Women for Agriculture.

Policy 5. Support appropriate efforts by private conservation organizations to utilize conservation easements as a tool for agricultural conservation.

Implementation: An evaluation of conservation easements will be conducted as part of the Williamson Act study mentioned above in the implementation of Policy 4.

FINDINGS - Agricultural Conservation

A total of approximately 3,650 acres of farmland was converted to urban use between 1967-1979 in the county. This involved the loss of some of the best quality soils in the county as most areas around the SUDPs are Prime or Statewide Important soils. Over this time period, for every addition of 9.4 people to the county population, an average of one acre of farmland was converted. However, the existing SUDPs can accommodate over 347,000 additional people over the 1980 population level, suggesting that the demand for land may be satisfied within existing urban boundaries for many years to come.

Rural "ranchette" and small acreage parcels may result in many more acres being taken out of agricultural production. Small minimum lot size requirements lead to creation of these rural residential estates, including 20 acre parcels which are usually part-time operations of people with nonfarm income sources. By increasing minimum agricultural parcel sizes where appropriate, farm productivity would be enhanced and the threat of ranchette-type development reduced. The existing 72,700 acres of agricultural land with parcels between 20-40 acres would provide sufficient opportunity for new and part-time farmers to enter into agricultural business.

Conflicts between agricultural and urban uses also place constraints on farming. Complaints over dust, noise, odor, pesticide use, and insects restrict farm activities, and in the extreme case, result in conversion or in the leaving of farmland idle. This impacts farm support operations and service availability to the remaining farms.

GOAL 2. Provide for the long-term conservation and use of productive agricultural lands.

Objective 2.A. Protect agricultural areas from conversion to nonagricultural uses.

Policy 1. Conversion of agricultural land into urban uses shall be allowed only where a clear and immediate need can be demonstrated, based on population projections and lack of land availability for nonagricultural uses.

Implementation: A similar program to that used in several community specific plans for Residential Reserve classifications can be utilized. Non-SUDP land can be admitted into the SUDP for development upon a showing to the satisfaction of the Board of Supervisors that land currently designated residential or residential reserve cannot be utilized for development within five years A showing that land currently designated as commercial or industrial within the SUDP cannot be utilized shall be applied to the expansion of the SUDP for commercial or industrial development, and another showing be made that the local district or city will be prepared to furnish sewer, water, and other services at the time of SUDP expansion.

Where five or more of the factors from Section 402 of the Land Use Element are applicable, and there is already adequate space in the SUDP, conversion to intensive uses will not be considered.

Where one to four of the factors applies and there is already adequate space in the SUDP, new land will only be added to the SUDP where an equal amount is taken out elsewhere. The appropriate location will be determined by the Planning Commission based on soil quality, proximity to existing development and urban services, and other relevant site-specific factors.

Where the proposal involves a City SUDP, and the City favors the SUDP expansion, then the City must determine the appropriate location for SUDP reductions if the city can demonstrate that current designated land is not available for the use designated. (The factors from Section 402 of the Land Use Element are presented in the "Proposed Amendments to the General Plan Land Use Element" on page H-2.)

Policy 2. Direct development to less valuable farmland when conversion is justified.

Implementation: A revision of the factors in Section 402 of the Land Use Element of the General Plan will be necessary. Eight factors will be applied to requests for conversion of agricultural or open space land to an intensive use. The complete revision is presented in the "Proposed Amendments to the General Plan Land Use Element" on page H-2.

Policy 3. Infilling of development in urban areas shall be encouraged.

Implementation: The Planning Department will investigate and recommend Zoning Ordinance and General Plan revisions that will promote infill development.

Objective 2.B. Discourage the parcelization of large holdings.

Policy 4. Investigate methods and incentives for increasing the minimum parcel sizes for agriculturally zoned land where appropriate using existing parcel sizes, soil quality and other relevant factors as may be determined.

Implementation: The Technical Advisory Committee for Agricultural Land Conservation (TAC/ALC) will undertake a study to devise options and incentives for increasing minimum parcel sizes in the agricultural zones.

Policy 5. Merge or revert to acreage substandard lots in "paper" subdivisions under the same ownership and not being used as separate parcels.

Implementation: Those rural subdivisions of five or more lots under one ownership which are currently used for farming are eligible to go through the merger or reversion to acreage application process as defined in the State Subdivision Map Act and the County Merger Ordinance. Where the combined area is 20 acres or less, the 20-acre designation will be retained (presently A-1).

Policy 6. Develop a voluntary program for merging adjacent parcels under the same ownership.

Implementation: The Planning Department, in coordination with County Counsel, will set up a program, procedures, and forms to facilitate the merging of parcels. The processing would be at no charge to the applicant.

Objective 2.C. Promote an understanding of the agricultural industry by urban dwellers as a means to reduce conflicts.

Policy 7. Enact measures to protect farmers from nuisance claims by urban dwellers.

Implementation: Adopt a "Right to Farm" ordinance that requires public notification of potential inconvenience or discomfort from residing next to a farming operation or farmland. Owners and purchasers of property adjacent to land designated for agricultural use on the General Plan Land Use Map outside SUDPs and RRCs would be served notice through various means of the County's policy to support agricultural operations as a priority use.

Policy 8. Encourage educational programs to inform children and adults of the importance of protecting farmland.

Implementation: The County Agricultural Commissioner and the University of California, Cooperative Extension should cooperate with organizations, such as the California Women for Agriculture, which educate the public on agriculture, and will assist in informing residents of the "right to farm" ordinance.

Policy 9. Encourage land improvement programs that increase soil productivity.

Implementation: The County shall encourage and cooperate with efforts of the U.C. Cooperative Extension and the various Resource Conservation Districts to improve soils in the County.

FINDINGS - Agricultural Uses

Not only do conflicts exist between agricultural and urban land uses, but often between different types of agricultural uses and support operations. At the present time, most agricultural support and processing operations are within SUDPs or scattered throughout the county's agricultural landscape. These uses often have environmental or growth inducing impacts. Small SUDPs that act as agricultural service centers have the potential to become urban centers that would further conflict with surrounding agricultural operations.

The agricultural sector of the county can be enhanced by designating many of the smaller SUDPs as Agricultural Services Centers, and providing Planned Agricultural Industrial Development zones for agricultural industries. Potential agricultural/urban impact problems can be avoided and the threat of small SUDP growth onto agricultural land reduced.

The use of productive agricultural land for mineral extraction should be avoided by using alternate resource locations.

GOAL 3. Assure the proper location and operation of those land uses which are potentially disruptive to the agricultural community.

Objective 3.A. Identify clear boundaries between urban and agricultural areas and provide land use buffers where feasible.

Policy 1. Provide land use transitions and buffers between urban and agricultural areas which reduce interference and protect agricultural land from conversion to nonagricultural uses.

Implementation: Continue to utilize transitional land uses around urban areas as buffers between towns and farmland, including Rural Residential Centers, industrial zones, public recreation areas, and natural features such as streams. Implementation of "Right to Farm" ordinance under Policy 7 of Goal 2 will also serve this policy.

Objective 3.B. Provide locations for agricultural service and convenience centers that serve the daily needs of the farm community.

Policy 2. Provide centers for agricultural support services and convenience commercial operations, known as Agricultural Services Centers (ASCs).

Policy 3. The county will encourage new agricultural service operations to locate in an ASC.

Implementation: Amend the Zoning Ordinance by creating an ASC zoning classification. This classification will be applied to the existing small SUDPs without public sewer or water service, and which presently act as agricultural centers. Permitted uses, densities, and ASC boundaries will be determined with the assistance of the Technical Advisory Committee for Agricultural Land Conservation (TAC/ALC) following the form described in Section E "Agricultural Support Services". Except those uses presently permitted in the A-1 zone commercial and service operations will only be permitted within an ASC. Modification of the Land Use Element will also be required. (See Page H-2)

Objective 3.C. Permit activities in agriculturally-zoned areas that support agricultural operations.

Policy 4. Permit on-farm product handling and selling operations as prescribed in the Zoning Ordinance.

Implementation: Continue to enforce agricultural zoning regulations which accommodate compatible uses and ban conflicting activities.

Objective 3.D. Provide proper location for non-urban land uses that conflict with agriculture.

Policy 5. Weigh the economic benefits of surface mining with the preservation of agriculture when considering mineral excavation proposals on land classified for agricultural uses.

Implementation: Recognizing sand and gravel as a diminishing resource, surface mining will be allowed as a conditional use on land. Each application will be evaluated on its own merits. Consideration for granting a conditional use permit will include: 1) Evaluation of sand gravel market; 2) Nature of the aggregate deposit - quantity, quality, and proximity to the market area; 3) Proximity of deposit to existing permitted extraction sites; 4) Drainage; 5) Water table; 6) Soil classifications; 7) Conformance with Merced County surface mining regulations including reclamation plans and bonding; 8) A comparison of the benefits of surface mining for the economy with the impacts on surrounding agricultural operations.

Objective 3.E. Improve the transport of agricultural products within the county.

Policy 6. The County favors the establishment of an additional all weather north-south road between Highways 165 and 59 and improvement of State Highways 165, 140, and 59.

Implementation: The Public Works Department should investigate ways to finance a new north-south road or improve existing roads such as Dan McNamara. The County will encourage the State to upgrade or widen Highways 165, 140, and 59.

FINDINGS - Water Issues

Many areas of the county are experiencing agricultural water quality and supply problems. The southeast area is affected by water shortages and overdraft of the groundwater supply. Groundwater quality and related soil salinity and sodic problems affect large areas of the county, primarily in the southern portion.

Flooding occurs in the central county and along the San Joaquin and Merced Rivers. Much of this land is not used for intensive crop production and results in minimal crop loss. But in wet winters, the damage to agriculture can be substantial as in the $3.75 million loss in the winter of 1982-83. Over the years, many flood control projects have been constructed to reduce the areas subject to flooding. More recent efforts have been focused primarily on urban flood protection.

Agricultural drainage activities are critical for areas with high water tables, frequent flooding and where soil or water quality requires excessive leaching to improve crop production. While many local drainage plans exist, a more regional approach will be required in the long run to protect existing agricultural land and prevent degradation of ground and surface water.

GOAL 4. Improve the management of water resources to benefit the agricultural community.

Objective 4.A. Support measures to protect and improve water quality.

Policy 1. The County favors efforts to ensure adequate surface water supplies to deficient areas.

Implementation: The Board will encourage programs by Federal, State, or regional bodies to supply additional surface water to deficient areas within the county. The Board will also encourage efforts by local districts to obtain grants or other funding for irrigation projects.

Policy 2. The County will encourage farmers to use irrigation methods which conserve water.

Implementation: The Agricultural Commissioner will continue to provide information on water conservation measures to farmers, and will coordinate with conservation efforts of the University of California, Cooperative Extension, local Resource Conservation Districts, the Soil Conservation Service, and irrigation districts.

Policy 3. The County will work with other responsible agencies to ensure that sources of water contamination (including boron, salt, selenium, and other trace element concentrations) do not enter agricultural or domestic water supplies, and will be reduced where water quality is already affected.

Implementation: The Board will encourage research into water quality improvement techniques like desalinization plants and detention basins for urban runoff. The Board will also encourage improvements to the drainage systems in the county, including the efforts of the San Joaquin River Flood Control Association, and completion of the San Luis Drain Project, or if it is determined that the San Luis Drain cannot be completed as designed, the removal and elimination of the drain in Merced County. Existing Health Department programs to review wastewater systems and monitor groundwater quality will help reduce the threat of groundwater contamination from urban and agricultural uses. The Board will continue to support the County Health Department in monitoring groundwater quality in the agricultural community.

Objective 4.B. Provide protection for agricultural and related activities from flooding.

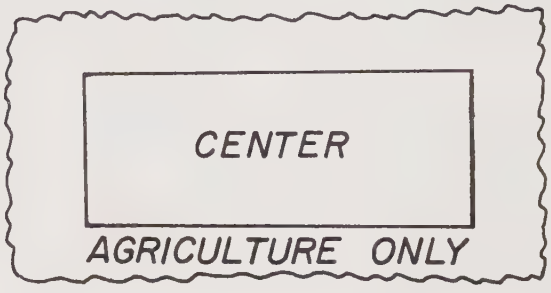
Policy 4. Protect rural development from flooding hazards.

Implementation: The Planning Department will continue to ensure that development in watersheds and flood plains conforms to County requirements including the "Flood Damage Prevention Ordinance."

Policy 5. The County will encourage implementation of programs for improved flood protection.

Implementation: The County will continue to assist efforts of local districts and communities in obtaining funding for local flood control projects. The Board will continue efforts to implement the Merced County Critical Area Flooding and Drainage Plan, the Merced County Streams Group Project, and the creation of the Merced County Flood Control District to maintain drainage capacity in natural channels.

H. PROPOSED AMENDMENTS TO THE GENERAL PLAN AND THE LAND USE ELEMENT

CURRENT TEXT:	PROPOSED CHANGES THROUGH ADOPTION OF THE AGRICULTURAL ELEMENT:
Section 103-Scope of the Plan-Describes the nine required elements of the General Plan and when each was adopted.	Section 103.1-A new subsection 103.1 should be added for optional elements of the General Plan to read: "103.1 Additional optional elements that have been completed include: a. Agricultural Element - sets out policies for the development, use and conservation of agricultural land. The purpose is to improve the viability of agricultural operations and promote the conservation of agricultural land."
Section 203-Plate 1-Displays four diagrams to describe the urban centered concept.	Section 203-Plate 1-Add the following diagram for ASCs: 
Section 206-Residential Intensity Standards- "General Standards for qualifying a low density determination throughout the County shall apply as follows:" ("a" through "e" discuss low density definition in SUDPs, RRCs, and HICs.)	Section 206-Add: "f. Within the boundary of an Agricultural Services Center, low density is considered one (1) dwelling unit per net acre."
Section 302.02-Objectives for City Fringe Areas-"C. Maintain agricultural use on all prime agricultural land in areas immediately adjacent to but outside the Urban Expansion Area until the land becomes qualified for urban use."	Section 302.02-Change "prime" to "productive". "C. Maintain agricultural use on all productive agricultural land . . ."
Section 303.02-Unincorporated Communities Objectives-"a. Restrict the intrusion of urban development into prime agricultural areas."	Section 303.02-"a. Restrict the intrusion of urban development into productive agricultural areas."

CURRENT TEXT:	PROPOSED CHANGES:
Section 304.01-RRCs-Introduction-Paragraph three reads: "Any intrusion into prime agricultural areas causes increased loss of valuable agricultural production and individual properties converted to rural homesites initiates rippling effects that caused adjoining parcels to be converted to nonagricultural uses."	Section 304.01-"Any intrusion into productive agricultural areas . . ."
Section 304.02-RRCs-Objectives-"b. Restrict the intrusion of rural residential development into prime agricultural areas."	Section 304.02-"b. Restrict the intrusion of rural residential development into productive agricultural areas."
Section 305.02-HICs-Objectives-"C. Restrict the intrusion of development into prime agricultural areas."	Section 305.02-"C. Restrict the intrusion of development into productive agricultural areas."
Section 401-Nonintensive Development Policies-Introduction- "Also, a commitment for the conservation and preservation of certain types of nonintensive land use has been effected by the Conservation and and Open Space Elements adopted as part of the County General Plan."	Section 401-"Also, a commitment for the conservation and preservation of certain types of nonintensive land use has been effected by the Agricultural, Conservation and Open Space Elements adopted as part of the County General Plan."
Section 402-Policy for Conversion to Nonintensive Lands-"The following criteria has been established and is to be applied to requests for conversion of agricultural or open space land to an intensive use adjacent to existing urban expansion areas of cities, unincorporated communities, that is Specific Urban Development Plan (SUDPs) or designated centers, that is Rural Residential Centers (RRCs), land not abutting an SUDP or an RRC shall not be converted to intensive uses. 1) Importance: Does the agricultural land have an alternate nonintensive land use available to it? 2) Limitation: Will an individual waste disposal system contaminate the the groundwater table? 3) Parcel Size: Will the size of the parcels created cause them to be economically unfeasible for agricultural use? 4) Compatibility: Will a non-	Section 402-Introductory Statement-The introductory statement and criteria have been modified to read: "The following criteria has been established and is to be applied to requests for conversion of agricultural or open space land to an intensive use adjacent to existing urban expansion areas of cities, unincorporated communities, that is Specific Urban Development Plan areas (SUDPs) or designated centers, that is Agricultural Services Centers (ASCs) and Rural Residential Centers (RRCs), land not abutting an SUDP, an ASC, or an RRC shall not be converted to intensive uses. 1) Soil: Is the soil suitable for agriculture according to the soil class? In general, Unique or higher quality soil as identified on the Important Farmland Map of the State Mapping and Monitoring Program. 2) Parcel Size: Is the present parcel a sufficient size for economic agricultural use? In general, 20 acres or larger. 3) Use: Is the land presently used, or has it

CURRENT TEXT:	PROPOSED CHANGES:
Section 402 Continued agricultural use create conflicts as to compatibility with adjacent agricultural uses? 5) Soil: Is the soil suitable for agriculture according to soil class? 6) Access: Will intensive use create dust and pollution detrimental to the existing agricultural uses? 7) Nature: Will intensive use destroy historical, archaeological, wildlife habitat, or other unique natural features? 8) Flood: Will intensive use present hazards to public health, welfare, and safety? 9) Water: Will an intensive use require creation of of a new community water system?	Section 402 Continued been recently used, for agriculture? In general, for irrigated crop or intensive livestock production within the past three years. 4) Compatibility: Will a nonagricultural use create conflicts as to compatibility with adjacent agricultural uses? In general, at least half the adjacent land area is devoted to agricultural uses. 5) Conflict: Is the subject property in proximity to a dairy, feed lot, or other concentrated animal raising operation? In general, within one-half mile of any such use. 6) Limitation: Will an individual waste disposal system contaminate the surface or groundwater table? 7) Flood: Will intensive use present hazards to public health, welfare, and safety? 8) Nature: Will intensive use destroy significant historical archaeological, wildlife habitat, or other unique natural features? If at least five of the above criteria are applicable, conversion of nonintensive lands will not be considered. In any event, if at least one criteria is answered affirmatively, the applicant must submit conclusive evidence to the Planning Commission that the benefits of the proposed conversion outweigh the negative impact on agricultural resources."
Section 403.02-Agricultural Objectives "To maintain and enhance the continued prosperity and growth of the agriculturally oriented segment of the County economy by: 1) Providing for long-term preservation and management of prime agricultural lands. 2) Assuring proper location and operation of those land uses which are potentially disruptive to the agricultural community. 3) Providing for necessary supportive services in the agricultural community. 4) Reducing the expansion of urban development on prime agricultural lands."	Section 403.02-Modify the four objectives as follows: "1) Providing for long-term conservation and use of productive agricultural lands." 2) Same as current text. "3) Permitting activities in the agricultural community that support agricultural operations." 4) Reducing the expansion of urban development on productive agricultural lands."
Section 403.03(a)-Agricultural Policies-Lists seven conditions to be considered for a conditional use permit in agricutural areas.	Section 403.03(a)- Add new condition: "8) The use is consistent with the intent and policies of the Agricultural Element."

CURRENT TEXT:

Section 404.03(c)-Grazing Policies
"7) The use should not be sited on prime agricultural land existing in the area."

PROPOSED CHANGES:

Section 404.03(c)-New wording for Policy 7:
"7) The use is consistent with the intent and policies of the Agricultural Element."

IV. TECHNICAL APPENDIX

ENVIRONMENTAL CHECKLIST FORM

(To Be Completed By Lead Agency)

I. Background

1. Name of Proponent MERCED COUNTY
2. Address and Phone Number of Proponent 2222 "M" STREET MERCED, CA 95340 (209) 385-7654
3. Date of Checklist Submitted FEBRUARY 1, 1984
4. Agency Requiring Checklist MERCED COUNTY
5. Name of Proposal, if applicable AGRICULTURAL ELEMENT OF THE MERCED COUNTY GENERAL PLAN

II. Environmental Impacts

(Explanations of all "yes" and "maybe" answers are required on attached sheets.)

	Yes	Maybe	No
1. Earth. Will the proposal result in:			
a. Unstable earth conditions or in changes in geologic substructures?	___	___	X
b. Disruptions, displacements, compaction or overcovering of the soil?	___	___	X
c. Change in topography or ground surface relief features?	___	___	X
d. The destruction, covering or modification of any unique geologic or physical features?	___	___	X
e. Any increase in wind or water erosion of soils, either on or off the site?	___	___	X
f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?	___	___	X

	Yes	Maybe	No
g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?	___	___	X
2. **Air.** Will the proposal result in:			
a. Substantial air emissions or deterioration of ambient air quality?	___	___	X
b. The creation of objectionable odors?	___	___	X
c. Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally?	___	___	X
3. **Water.** Will the proposal result in:			
a. Changes in currents, or the course of direction of water movements, in either marine or fresh waters?	___	___	X
b. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	___	___	X
c. Alterations to the course or flow of flood waters?	___	___	X
d. Change in the amount of surface water in any water body?	___	___	X
e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?	___	___	X
f. Alteration of the direction or rate of flow of ground waters?	___	___	X
g. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	___	___	X
h. Substantial reduction in the amount of water otherwise available for public water supplies?	___	___	X
i. Exposure of people or property to water related hazards such as flooding or tidal waves?	___	___	X

		Yes	Maybe	No
4.	**Plant Life.** Will the proposal result in:			
	a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)?	___	___	X
	b. Reduction of the numbers of any unique, rare or endangered species of plants?	___	___	X
	c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	___	___	X
	d. Reduction in acreage of any agricultural crop?	___	___	X
5.	**Animal Life.** Will the proposal result in:			
	a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)?	___	___	X
	b. Reduction of the numbers of any unique, rare or endangered species of animals?	___	___	X
	c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	___	___	X
	d. Deterioration to existing fish or wildlife habitat?	___	___	X
6.	**Noise.** Will the proposal result in:			
	a. Increases in existing noise levels?	___	___	X
	b. Exposure of people to severe noise levels?	___	___	X
7.	Light and Glare. Will the proposal produce new light or glare?	___	___	X
8.	Land Use. Will the proposal result in a substantial alteration of the present or planned land use of an area?	___	X	___
9.	Natural Resources. Will the proposal result in:			
	a. Increase in the rate of use of any natural resources?	___	___	X

	Yes	Maybe	No
b. Substantial depletion of any nonrenewable natural resource?	___	___	X
10. Risk of Upset. Will the proposal involve:			
a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	___	___	X
b. Possible interference with an emergency response plan or an emergency evacuation plan?	___	___	X
11. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?	X	___	___
12. Housing. Will the proposal affect existing housing, or create a demand for additional housing?	___	___	X
13. Transportation/Circulation. Will the proposal result in:			
a. Generation of substantial additional vehicular movement?	___	___	X
b. Effects on existing parking facilities, or demand for new parking?	___	___	X
c. Substantial impact upon existing transportation systems?	___	___	X
d. Alterations to present patterns of circulation or movement of people and/or goods?	___	___	X
e. Alterations to waterborne, rail or air traffic?	___	___	X
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	___	___	X
14. Public Services. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:	___	___	X
a. Fire protection?	___	___	X
b. Police protection?	___	___	X
c. Schools?	___	___	X

	Yes	Maybe	No
d. Parks or other recreational facilities?	___	___	X
e. Maintenance of public facilities, including roads?	___	___	X
f. Other governmental services?	X	___	___
15. Energy. Will the proposal result in:			
a. Use of substantial amounts of fuel or energy?	___	___	X
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	___	___	X
16. Utilities. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:			
a. Power or natural gas?	___	___	X
b. Communications systems?	___	___	X
c. Water?	___	___	X
d. Sewer or septic tanks?	___	___	X
e. Storm water drainage?	___	___	X
f. Solid waste and disposal?	___	___	X
17. Human Health. Will the proposal result in:			
a. Creation of any health hazard or potential health hazard (excluding mental health)?	___	___	X
b. Exposure of people to potential health hazards?	___	___	X
18. Aesthetics. Will the proposal result in the obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?	___	___	X
19. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?	___	___	X
20. Cultural Resources.			
a. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archaeological site?	___	___	X

	Yes	Maybe	No
b. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?	___	___	X
c. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?	___	___	X
d. Will the proposal restrict existing religious or sacred uses within the potential impact area?	___	___	X
21. Mandatory Findings of Significance.			
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	___	___	X
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)	___	___	X
c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)	___	___	X
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	___	___	X

III. Discussion of Environmental Evaluation

(See next page)

Prepared by William R. Nicholson

Date Feb. 1, 1984

III. DISCUSSION OF ENVIRONMENTAL EVALUATION

8. LAND USE

The proposal includes redesignation of some of the smaller SUDPs as ASCs to restrict the types of uses allowed. Although these areas have experienced little growth or change in land use for many years, future potential development would be limited to one acre housing sites and agricultural related services and convenience commercial operations. All nonresidential development would require a conditional use permit. Because one acre homesites are the minimum size for individual septic systems, growth would be much more restricted than at present where higher densities are permitted.

11. POPULATION

The Agricultural Element may result in reduced rural residential "ranchette" type developments where parcel sizes are increased, and direct this growth to SUDPs, RRCs, and areas where the designations do not change. The amount of farm-related housing - including farm labor housing - permitted on each parcel will not be effected. Population density may increase, to a limited degree, in the dredge tailings near Snelling from the reduction in permitted parcel sizes to 20 acres.

14. PUBLIC SERVICES (f)

Various policies of the Element will require an increase in development review and project coordination by some County departments. The following programs will all require a commitment of Planning Department (or other department) staff time to implement: drafting and enforcing a "Right to Farm" Ordinance, rezoning agricultural areas to 40, 80, and 160 acre parcels, merging substandard parcels in "paper" subdivisions, developing a voluntary merger program, and conversion of small SUDPs into ASCs.

Adoption of the Williamson Act, and to a lesser degree a conservation easement program, could result in a reduction in governmental services due to a loss in county revenue. County Counsel and Assessor's Office research into these programs will require additional staff time.

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